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ABSTRACT

Plans for the American Chemical Society's (ACS) information-oriented activities for the next five years (1971-1975) are summarized. Although the Society is concerned with a great variety of matters, only those programs closely related to chemical information are included in this document. It brings together thinking from all parts of the Society--membership, management, and staff--on how to deal with problems of scientific and technical information transfer in the near future. This Plan is essentially a statement of intent, for it shows the direction and proposed magnitude of the Society's future efforts. It is the first document of this nature produced for the overall ACS and, as such, it contains background and management material which will not all be repreated in subsequent revisions. It will be modified annually in accordance with the ACS planning cycle. Recognizing the importance of working cooperatively with other organizations involved in chemical information transfer, the Society will make this Plan available to the general chemical community for study and comment. (Author)

SEPTEMBER 1970

A FIVE-YEAR PLAN
for
INFORMATION PROGRAMS
1971—1975

American Chemical Society
Washington, D. C.

COPY _____

INFORMATION SYSTEMS PLAN

EXECUTIVE DIRECTOR'S OFFICE
AMERICAN CHEMICAL SOCIETY
WASHINGTON, D. C.

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INTRODUCTION

This document summarizes plans for the American Chemical Society's information-oriented activities for the next five years (1971-1975). Although the Society is concerned with a great variety of matters, only those programs closely related to chemical information are included in this document. It brings together thinking from all parts of the Society--membership, management, and staff--on how to deal with problems of scientific and technical information transfer in the near future.

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OBJECTIVES OF THE SOCIETY'S INFORMATION PROGRAMS

The American Chemical Society was founded in 1876 and presently has more than 100,000 members. It is now the world's largest body devoted to the advancement of a single science. The Society was chartered in 1937 by the Congress of the United States for the following purposes: to encourage in the broadest and most liberal manner the advancement of chemistry in all its branches; to promote research in chemical science and industry; to improve the qualifications and usefulness of chemists through high standards of professional ethics, education and attainments; to promote the increase and diffusion of chemical knowledge, and by its meetings, professional contacts, reports, papers, discussions, and publications, to promote scientific interests and inquiry, thereby fostering public welfare and education, aiding the development of our country's industries, and adding to the material prosperity and happiness of our people. In addition, the Charter also imposes an obligation on the Society "to investigate, examine, experiment, and report upon any subject related to chemistry and connected to the national health, welfare, and defense."

The primary purpose of ACS activities in information is to assist and stimulate the transfer of chemical information in useful forms to all who need it. In terms of the Society's information programs, this primary purpose is expressed in the following objectives:

1. To tailor its information products and services to the individual needs and values of the users, both directly and

through the internal information systems and programs of their institutions.

2. To develop in cooperation with associated disciplines programs, products, and services in interdisciplinary areas so as to facilitate exchanges of chemical knowledge across disciplinary boundaries when the need arises for such exchanges.

3. To assist in the improvement of the quality of education in chemical science and technology, especially with regard to the newer teaching techniques and modern information handling methods.

4. To use ACS resources of information, membership, and staff to gather, interpret, and convey data of socio-economic utility that otherwise would be nearly impossible or highly expensive to generate, and by so doing to improve and foster the public welfare.

5. To reduce unnecessary duplication of effort and substance within and, to the best of our abilities, outside the ACS; this would be accomplished internally by combining, where practical, the intellectual activities of abstracting, indexing, reviewing and editing, and by converting the primary and secondary chemical information to a common base; externally this could be realized through cooperation with other societies and organizations, both public and private.

6. To make all chemical information accessible by extending indexing services in all areas.

7. To establish banks of chemical data (in contradistinction to document access), organized into useful categories, such as by properties of substances.

8. To reduce the time lag between the generation and availability of information.

9. To support higher standards of chemical practice by working toward increased excellence in primary journals, books, and other products and services.

10. To utilize modern methods of information acquisition, processing, and dissemination as soon as practical by maintaining awareness of all hardware and software developments relating to information handling.

11. To improve techniques of disseminating information to audiences with specialized interests.

12. To generate general community support (intellectual, educational, financial, and technological) through responsiveness to expressions of need and interest from individuals and institutions in science, technology, and government.

OVERVIEW

Background

Characteristically, scientific information systems grow from small, informal, subdisciplines that are at the frontiers of some field of science. Individuals have a need to exchange ideas so as to expand their own understanding of science and to learn new concepts. The original grouping is small, and the resulting information exchanges are usually informal and interactive. When such a group becomes viable and productive (which is possible when it involves innovative pioneers), more and more people declare a need for its ideas and data. A journal is produced, the group may formally incorporate, its membership grows, becoming more formal, more unwieldy and ultimately less interactive or responsive. Within the newly developed large group of individuals, a subgroup with precise information needs in a particular area gets together informally as an "invisible college" to exchange ideas, and the cycle starts again.

As long as the number of active scientists was small, idea production was correspondingly small and knowledge was not fragmented. A small number of meetings of reasonable size and a few learned journals would bring a man much of the knowledge available in amounts that he could handle. It was possible for a given scientist to be the lab worker, collector of applicable data, correlator of diverse data, and innovator.

Libraries could collect, and store for access by the individual, all current relevant knowledge. Reviewing and abstracting were manageable tasks. Undirected growth was tolerable.

Present

The approach described above fulfilled user needs for a long time. The number of users and the volume of information handled have, however, a multiplicative effect on each other. New tools are applied to traditional media just to keep abreast of progress. The application of these new methods cannot, in itself, solve the information transfer problem.

Currently, difficulties are appearing in almost every aspect of technical information transfer. Papers are produced in large numbers on an international scale, duplication of effort occurs, the system is becoming very complex as are its its basic parts, namely collection, processing, storage, and dissemination. Collection of what is new and relevant is difficult; review for quality is becoming more difficult; storage facilities and media are taxed; dissemination channels are imprecise and costly; new products arise more from what publishers think users want than from clear knowledge of what users want; users are unable to specify adequately what they really want; retrieval and access methods and media are caught in volume, time, cost and precision binds. Much material of questionable value enters the system, and this adds to the problem of providing precise responses to queries or needs at reasonable cost.

In order to respond to needs, varied methodologies and overlapping efforts have arisen. The meetings and informal contacts established through discipline-oriented societies, it appears,

are accomplishing less than needed in the way of information transfer. No one has a clear concept of the total informal communications picture, even though this type of communication has been recognized as a major, even fundamental, mechanism for both entry and evaluation of information. There is insufficient interplay between the primary services and the secondary processors, or among distinct primary services. The secondary area has some cooperative efforts, but little has been done to effect improvement in the informal area, or to tie informal exchanges to the primary-secondary group. It would seem that where interfaces occur, time, cost, and precision problems could be lessened by a "total system" approach.

It appears that a potentially promising way to deal with some of these problems is with computers. Chemical Abstracts Service Division, which has the largest volume problem in the Society, is in the process of converting to a computer base. The Publications Division, whose need is not yet so great, is experimenting with computers to prepare itself for the day when it, too, must rely on mechanization. However, it is not yet clear how meetings and other informal communications processes will benefit from the computerization.

Computer processing and tailored services (and the R&D necessary to develop these) are expensive. Information has a value, which is a complex function of its nature, extent, immediacy, and relevance. The prices the Society places on its information products cannot exceed this value. As the price-value relationships are not clear, continued study in this area is essential. For

example, some 60% of the members of the ACS do not subscribe to any information product or service other than C&EN. To what extent is this a function of price? To what extent is the design or content of the information package a factor? To what extent do institutional information programs, using ACS information packages, substitute for direct service?

In addition to the sense of need growing out of the Society's experience and observations, external pressures are being put on the information world in general to innovate and change. Many Government agencies have expressed their intense interest in scientific information handling, and several are actually involved. The National Academy of Sciences' Committee on Scientific and Technical Information (SATCOM) has published a series of recommendations which reflect many of the same concerns. Increasingly, published literature carries responsible and constructive suggestions for innovations in processing, storing, and retrieving information.

CHEMICAL ABSTRACTS has achieved a premier position in the information processing world by applying modern methods to collecting, processing, storing, and retrieving abstracts of all primary chemical information, thereby maintaining the high quality of its products. Chemical Abstracts Service Division, as indicated earlier, is leading the way in conversion to a computer base. It also is building, or cooperating in building, an information network which will ease the burden on any one segment of the information community, yet will make available to the user data stored anywhere in the entire network. There has been cooperation with other secondary services, other primary services, academia, and private organizations.

The growing capability for data communication networks is sure to have a long term impact on all information transfer. CAS will exploit the fact that its data (or basic building blocks for products) is in machine manipulatable form. This means different packages can be prepared from the same base without the need for additional intellectual effort once common data items are established and standardized and procedures for putting together the package are formalized. CAS also is building the Chemical Registry which provides a unique methodology of chemical compound identification. (The Registry, of course, can be applied to documents dealing with chemical compounds or can be used as a central point or search parameter for information about compounds.) The Registry speaks in a universal language.

The products and services of CAS are basically awareness and search tools. For full information, one must go to the source document from which any specific abstract was drawn. To help locate the source document, CAS provides another service derived from the computer base--a system of comprehensive publications with updates that lists libraries having the periodicals abstracted in CA.

It is apparent that those who create and discover facts are not necessarily those who sift, absorb, and correlate them. ACS experiments in the primary publications area may thus be seen as supplementing the automated search tools for accession to the primary literature now provided by CAS. The melding together of the processing systems for primary and secondary literature might therefore eventually occur. One intellectual processing, one editing, and one keyboarding from original primary literature

input to output in the form of derivative services appears to be the ideal. Under the present five year plan, the interface between ACS primary publications and CAS will be handled in much the same way as CAS works with its decentralized input centers, operated by the Chemical Society of London and Gesellschaft Deutscher Chemiker. The Publications Division will act as the input center responsible for ACS journals, plus other papers and reports designated in guidelines yet to be developed within the Society. This offers two advantages: (1) It puts the Publications Division in a position to develop a usable new product from its data base, and (2) it provides an input center separate from CAS, but under ACS management. This facilitates joint pilot operations and agreements that bridge the primary-secondary sphere. In addition, standards can be readily established, and the ACS primary publications operation can serve as a demonstration center for other primary information processors.

The Future

At some point in the distant future there will be a comprehensive network for scientific and technical information, with many avenues of access. In response to user needs, primary information will continue to be disseminated on a routine basis, with the package selectively prepared for individuals or well-defined small groups, as opposed to the current, tradition -oriented system.

Compilations and syntheses will be provided which will, to a certain extent, make retrospective searches unnecessary in the area covered by the review. Compilations and reviews will form the basis for reasonable purging of files. Those files less

likely to be queried will be moved farther and farther off line so as to cut down on wasted search time. There will be selective data retrieval in addition to selective document retrieval. Studies show that users often want only parts of articles, books, and reviews; such literature must be organized and indexed to be made accessible in piecemeal fashion. To have such modular access to documents, input must be precisely controlled and described so that any part of the document which might be sought at some future point in the processing or dissemination stream is clearly flagged. Such methodology might also be helpful during editorial review of a paper so that all parts would not be delayed in processing by that part requiring the longest processing time.

Highly sophisticated, specific response systems do not offer opportunities for browsing and reading in peripheral areas. However, there is some value to be gained in being supplied with unrequested information. Thus, methods for enabling an individual to acquire information not specifically sought should be available.

Informal information is not as easy to characterize and hence is less susceptible to systems treatment. The Society recognizes the need for people to interact personally. Through the informal channel, people learn of ideas and efforts as they are being formed, often long before publication. Knowing a scientist enables one to follow, assist informally in, or contribute directly to his work. It is the Society's aim to bring together appropriate groups for information exchanges; therefore, conferences will be emphasized. Modern equipment such as videotapes, closed circuit TV, audiotape and films will assume a more prominent role in informal communication or as education devices.

It is clear that some of the processes of information transfer, both formal and informal, will be so different from those now in use that the educational process must help prepare the student--the practitioner of the future--to use them. Realization of all these objectives requires development of educational procedures to prepare chemists and chemical engineers to take full advantage of the information system's new capabilities. New products such as textbooks, lectures on film, and computer-assisted instruction will be investigated. The experiment at the University of Nottingham, United Kingdom, (supporting graduate students with CAS services on demand) is an early example of such direct effort.

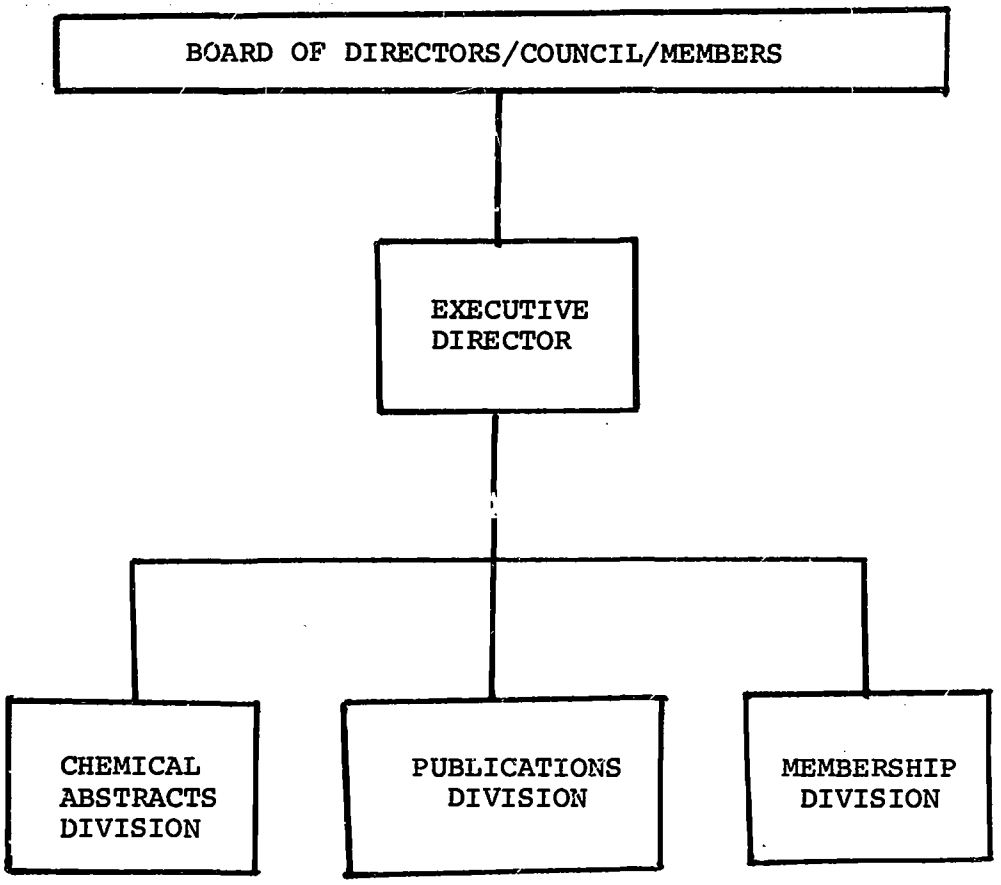

Figure 1

STAFF ORGANIZATION AND OPERATION

As of July 1, 1970, the Society staff was organized as indicated in figure 1. The Board of Directors is the Society's policy-making body. As the organized voice of the membership, the Council transmits member needs and desires to the Board. Overall responsibility for execution of policy and directing operations rests with the Executive Director. He works with the Division Directors (Chemical Abstracts Service, Publications, and Membership) in developing operational programs to execute policy. Together, they establish priorities, coordinate Divisional programs, and monitor progress.

Financial Policies

The ACS overall financial policy is to break even and preferably build up some reserves to sustain unexpected expenses, to compensate for unanticipated loss of income, and to provide for growth. Some of the more specific policies guiding the Society's approach to financial management are:

1. Each major Division (i.e., Publications, Chemical Abstracts Service, and Membership) shall be self-supporting over the long term.
2. Members dues and prices for products and services designed for members are set at levels consistent with the Society's objective of fostering individual participation and use.

3. Subscription, lease, and license prices for Society publications and services designed for institutional use are normally established to last for two or more years. This results in cycles of net operating gains and losses, which are dealt with by multi-year planning.
4. Each operating division must cover the full operating expenses of the facilities it uses, including building depreciation and interest on mortgage loans.
5. Each operating division must pay for any equipment purchased and used by that division.

In addition to these general policies, the Society has established the practices of preparing long-range financial forecasts and annual operating budgets, of reporting financial performance in comparison with Board-approved forecasts and budgets, accounting at the Division level on a combined direct and indirect cost basis, and accounting at the program level on a direct cost basis.

These financial reports and projections, when coupled with non-financial operating data, permit measurement of cost effectiveness and trends therein on a line item basis, on a program basis, and on a Division basis, among others. Staff managers continually study the available cost effectiveness factors and develop additional ones as warranted.

Planning Cycle

Planning is a continuing activity, phased to produce by

December of each year both the final budget and programs for the following calendar year and outlines of programs and finances for the four years thereafter. (Longer range plans are prepared when necessary.)

Responsibility for developing Divisional Plans resides with the Director of each Division. The first step in the annual process is preparation of a detailed five-year forecast of consequences of existing policies and programs. This forecast, after review and approval by the Executive Director, is submitted through him to the Board of Directors by mid-May for its review, comment, and policy guidance. New or modified plans, including requests for policy decisions, are developed by staff, reviewed by the Executive Director, and submitted to the Board for preliminary action at its September meeting. Unresolved matters and final adjustments are handled by the Board at its December meeting, when it approves the program and budget for the ensuing year in the five-year context.

Response to User Needs

The ACS must carefully consult with users and potential users of its publications and services before establishing or changing specifications. An example of the results of such consultation is the recently established CAS Standard Distribution Format (SDF) for tape services. Several institutional users were consulted when SDF was in draft form. Adjustments in SDF were then made in accordance with these users' comments.

To assure good communication between ACS and the users of its computer-readable files, and to help in coalescing user opinions and plans, ACS initiated discussions which led to the founding of the Association of Scientific Information Dissemination Centers (ASIDIC) in the United States and of Operators of Chemical Information Systems (EUSIDIC) in Europe.

Cooperative efforts with others in the scientific, technical, and information-handling communities must facilitate the transfer of information both outward from the ACS and inward to the ACS. The Society strives to make users of its services aware of potential changes in time to gain user guidance and support in making the changes. ACS informs associated information processors about its plans and progress by presenting its R&D efforts for external review and participating in community activities which affect ACS performance (for example, the establishment of information-handling standards).

These activities require the effort of senior managerial and technical staff. One task of an NSF contract specifically supports these activities for CAS programs, and the ACS provides additional support from its own resources. However, community attention to the developing ACS system continues to grow more rapidly than the supply of time and support. Therefore, liaison efforts are continuously evaluated and priorities established.

In areas where the Society products and services are designed primarily for individuals, additional techniques uniquely available to the ACS are utilized.

The Council Committee on National Meetings and Divisional Activities provided not only policy guidance but also knowledgeable analysis and interpretation of data on meeting attendance, performance, and value during the development of the plans and programs for meetings presented in this plan.

Accounts of Chemical Research was created in response to the urgent need for review material expressed by the members through their Divisional representatives and the Council Committee on Publications. The journal owes much of its design and character to opinions expressed by members of five Society Divisions surveyed specifically for this insight.

The Society's Committee on Corporation Associates, representing some 45% of the productive capacity of companies employing chemists and chemical engineers, studied the value of chemical information to its member companies. Although the results were highly qualitative, they indicated that the amount of money spent on information services is more than sufficient to justify the Society's investment in improved services.

Personnel Considerations

Sophisticated information systems require trained personnel such as information scientists, discipline-oriented scientists, machine operators and maintenance crews, managers, and administrators. As Society information programs have developed and expanded, the need for people of this nature has increased noticeably.

The supply of such people is limited and seems likely

to remain so. Good people must be retained, managers must be developed, and new people must be trained. The Society has designed its personnel policies to attract competent people from the chemical community and to train them in information science. This effort will be continued and expanded as necessary.

The ACS has explored the possibility of creating information analysis centers for specialty areas. In the area of fluidized beds, for example, it was found that a full-time staff of high caliber individuals must be devoted to such an effort. ACS priorities dictate that for the period of the Plan such high caliber personnel employed in the Society can be used to greater advantage elsewhere, but modifications of this approach are under consideration.

Equipment Considerations

It is recognized that data accumulate at an astonishing rate. Therefore, equipment such as optical devices, microforms, electronic communication systems, video and audio systems, and computers, to handle enormous amounts of material conveniently and rapidly will become more important elements of ACS production systems in the future. It is ACS policy to develop systems in modular fashion whenever possible, using readily available equipment for which a work force can be obtained or easily trained.

With more sophisticated output methods, devices such as microform readers, computers and software, and projection equipment must likewise be available to the user who must also be trained in

their use. Devices for interaction with the data base for input and output or for processing are currently being studied or developed and should lead to simpler, more effective systems. Studies of man/machine interaction must be made to increase utilization of machines and reduce costs.

CHEMICAL ABSTRACTS SERVICE

The principal objective of Chemical Abstracts Service is to provide access to the literature of chemistry and chemical engineering. It abstracts its information from primary journals, patents, and reports; it organizes, indexes, and stores the abstracted information and it makes that information available to the chemical community in a variety of publications and services.

Chemical Abstracts, CAS's principal publication, is the key to the world's chemical literature, and is a national resource of major significance. It endeavors to provide comprehensive coverage of its field leading to a high volume of material to process, a continuous growth in this volume and high costs which depend on factors for the most part beyond CAS's control. Despite these problems of growth and cost, Chemical Abstracts Service has not only remained viable but has improved processing time and introduced a series of developmental services designed to increase the accessibility and utility of the information processed.

CAS is at a higher level of system development than either the informal or the primary services. It is much further along in commitment to machine processing. Its product costs are also higher and its marketing procedures different. It is becoming an integral part of an international network for providing access to scientific and technical information. This network is on two levels: (1) input centers operated through cooperative efforts, aimed at reducing duplicative effort and cost; (2) the development of information centers to act as retailers for the output from CAS and other computer readable services. In this manner, duplication

of effort is reduced and the user gains access to a multidisciplinary information base.

Within five years, input from the United Kingdom and West Germany will be supplied in machine-readable form. By 1976 there will be a direct interlink between ACS Primary Publications and CAS. This and other experiments with the Publications Division should provide valuable information for designing and constructing an information network.

The need for cooperation among secondary processors is obvious in light of the rates of growth of the primary and secondary publications. Overall, the primary publications of science and technology appear to be growing five to six percent a year whereas the coverage of CHEMICAL ABSTRACTS increases at about nine percent a year. The difference between these figures is a result of the increasing trend of other sciences to explain observations in terms of basic principles (i.e., chemistry, physics, and mathematics) and the push of technology toward rationalization in terms of basic science. This growing overlap of disciplinary interests obviously creates problems for all sciences. Hence, the secondary information-accessing services of the bridging disciplines (i.e., chemistry, physics, and mathematics) must be in harmony with other similar services to help create effective interlinkages which will reduce unnecessary overlap.

The conversion of burdensome manual processing to computer-assisted processing will be extended. A management information system is being developed which will eventually be expanded throughout the ACS. The Chemical Registry will continue to grow, and in 1973,

if funding is available, CAS will begin to process into the Registry Base substances identified in pre-1965 CA subject indexes. Man and machine interactions will increase and eventually CAS will have a direct access Registry.

The shift toward computer based production systems for secondary publications and services can solve many of the economic problems associated with traditional manual publication systems by greatly reducing the wasteful effort inherent in the traditional systems. The availability of a computer-readable record corresponding to a printed publication further extends the usefulness of the intellectual effort which goes into preparing the informational content of the record. This availability of computer-readable information, however, creates a new series of problems for both producers and users of information services.

Whereas the general public knows what to do with a printed book or journal, no such wide acquaintance or general competence exists with respect to computer-readable information. Not only must a subscriber implement a system for using the computer-readable services -- often a complex problem -- but he must learn to utilize the service effectively, which is also an expensive process. In addition, many potential users of computer-readable services do not have suitable computing equipment available. One promising answer to such problems is the development of information centers which provide implementation services, education support, and "retail" access to the computer-readable files. For centers to be successful, there must be close working relationships between the information processors and the centers using the processors computer-readable services.

Most individuals and organizations using CAS computer-readable services also use services furnished by other processors. This brings pressure from the community for standardization of processing practices and focuses attention on the need for compatability among computer-readable services provided by two or more processors which overlap in their coverage. Overall, such combinations of use of computer-based information services therefore can be expected to increase coordination and cooperation among information processors as well as between processors and users.

ACS Processing System Plan

The Society is planning processing operations that will make it possible for chemical information users to obtain access to an integrated set of information services, including a variety of printed publications and computer-readable packages of information. The new production system will consist of three segments: Input, Production Files, and Output, as shown in Figure 2. The Input System will include all processing operations required to provide fully validated data organized for addition to the Production Files. The Production Files will receive and hold all of the fully processed input which is ready for inclusion in ACS publications and services. The Output System selects the content of each information package from the Production Files and completes the packaging operation through the composition process for printed publications and through other means and media depending on the service.

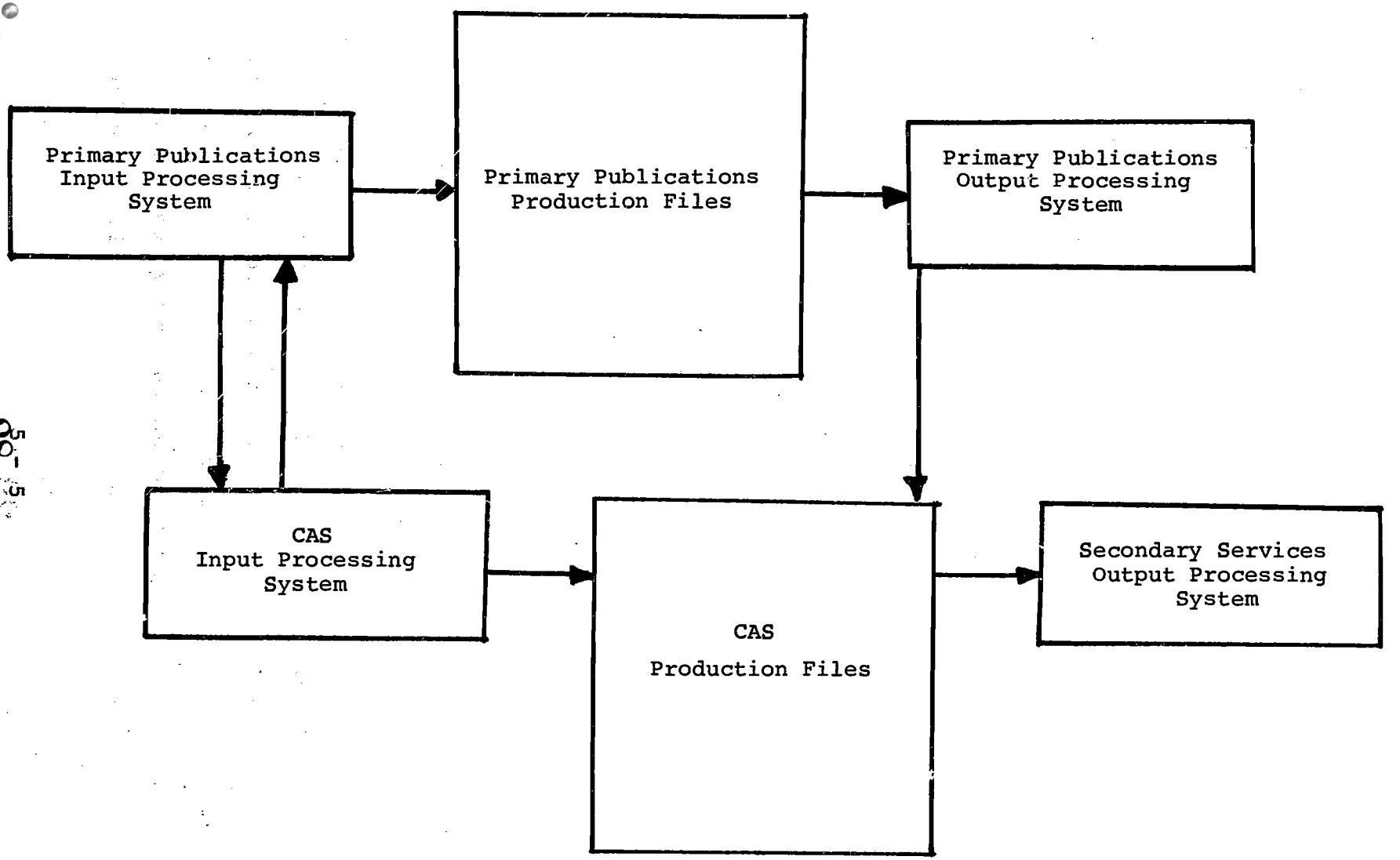

Figure 2 -- The ACS Production System

Input Processing System

Each manuscript submitted for publication in an ACS primary journal will be assigned a unique Manuscript Number as the first step in processing to serve for subsequent identification. The Manuscript Number will include identification of the specific ACS primary publication for which that manuscript is a candidate at the earliest point in processing that this is known.

Accepted manuscripts enter the Primary Publications Input Processing System from various editors. Data elements to be extracted from the record for processing into the CAS data base are flagged and transmitted to CAS Input Processing System.

The points of appearance within the text of graphic material to be included in the printed publication will be identified by Primary Publications staff. The text and the graphics then enter their respective process streams. All segments of the input data for a given manuscript will be tied together by the Manuscript Number. The individual data segments (i.e., the text, index entries, and graphic material) corresponding to a given manuscript will enter and be held in temporary storage until all segments of the manuscript arrive. Meanwhile CAS will have been processing pertinent segments of the manuscript to generate Registry Numbers and additional index entries, among other things, and will return this information with the associated Manuscript Number to the Primary Input Files. The addition of such data to a manuscript record in temporary storage, flags that manuscript for composition in galley form. The galley and temporary storage record are edited and corrected by both the Primary and Secondary Services. When a manuscript has been fully

corrected, it enters the Primary Production Files where it awaits scheduling for the next available issue. When the page numbers are assigned, the complete bibliographic citation is attached to the Manuscript Number and forwarded to the CAS Input Systems temporary storage files to complete the corresponding Data Set and thereby release it for use in the CAS Output Processing System.

The Input System will depend ideally upon one-time input processing of each element of data. For a non-ACS primary paper, patent, or report covered by CAS, this means identification of each CAS publication or service which is intended to cover that primary document. Wherever feasible, input includes Unit-by-Unit Editing of the data records. Check characters or intellectually computed data may be added to the basic data records as part of the input to extend the automatically verifiable characteristics and thereby simplify error detection. When an error in an input record has been identified, that record will be corrected and reprocessed through the editing cycles before it is passed on to the next input processing step. The input process may include the automatic conversion of widely variant forms of a given data record to a canonical form to avoid imprecision in the encoding process and subsequent scattering of data in resulting indexes.

The last CAS input-processing step consists of organizing and placing in proper format the fully validated data for interfiling in the CAS Production Files.

The Production Files

Functions of the CAS Production Files include the interfiling of data released from the corresponding Input System, the monitoring of data as it flows into the Output System, and an

Inventory Control System. This system will identify, for the Output System, the time at which all data corresponding to a given primary manuscript or for a given CAS input document arrived in the appropriate Production Files through the several input-processing streams. The system will also bring out for review incomplete Data Sets that have been resident in the files for a stipulated period of time.

The Inventory Control System will keep track of usage by recording each instance when a given primary manuscript or CAS Data Set is taken by an Output System for inclusion in a publication or service. Thus when a manuscript has been forwarded for use in an issue of a specified primary journal or when a given Data Set has been included in all of the packages for which it was flagged in the input process, it will be automatically removed from the Production Files.

Output for a given information package will start with the automatic selection of the appropriate manuscripts or the appropriate data from the Production Files. Manuscripts or Data Sets in the Production Files that are identified as ready for use by the Inventory Control System will be extracted for Output processing by utilizing the product flags that were attached to each manuscript and Data Set during the input process.

CAS Processing System

CAS processing starts with the acquisition of primary journals, patents, and reports, from which relevant material will be selected for CAS coverage. To each will be assigned a unique, computer-checkable Document Registration Number, and non-English

titles will be translated into English. For each document, the Document Registration Number, the English title, bibliographic citation, author names, identification of the individual CAS information packages in which that document is to be covered, etc., will be entered into the CAS Inventory Control File and the document will be assigned to an appropriate inhouse subject specialist to extract all the data to be included in the full range of CAS information packages covering that document. Textual data -- the body of the abstract and index entries in preliminary form -- and structures will be separately recorded. Structures and names of substances will be automatically processed through the Chemical Registry, index entries will be converted to standardized language and form, and abstracts will be edited. It is at this point that data extracted from the ACS primary manuscripts will enter the CAS system and the Registry Number and standardized index entries will be copied from the CAS processing stream and forwarded to the Primary Input Files. Data Sets derived from ACS primary journals will utilize Manuscript Numbers in place of Document Registration Numbers to interlink the segments of the Data Set during input processing. The individual CAS data segments (i.e., the heading data from the Inventory Control File; the abstract, including the structures which will appear in the abstract; and index entries) will be released to the Production Files as quickly as they are released from input processing. The Control System will identify any Data Set derived from a non-ACS primary document as ready for use in CAS information packages as soon as all segments of that Data Set are in the Production Files.

A Data Set corresponding to an ACS primary journal article is flagged as ready for use when the Primary Output Processing System forwards the appropriate completed bibliographic citation in combination with the ACS Manuscript Number for addition to the Data Set on file in the CAS Production Files. The CAS data records that are converted into coded form as part of the input-processing operation will remain in coded form in the Production Files as in-process data.

Decentralization of CAS Input Operations

One of the primary characteristics of the computer-based system is that it will permit a greater degree of decentralization than has ever been practical before. Thus, CAS is working to establish both decentralized input and decentralized output for the developing system. The output decentralization is already starting to occur. The input system will be decentralized in steps during the next several years through a series of closely coordinated, bilateral projects. The first two such agreements are with the Chemical Society (London) and with the German Chemical Society (Gesellschaft Deutscher Chemiker).

Each input center will be responsible for an agreed upon set of non-ACS primary publications. Each input center will be responsible for selecting the individual papers, patents, and reports to be processed into the system from the primary publications for which that center is responsible. As much of the intellectual efforts as possible will be completed as a part of the initial input processing.

Internal Cooperative Projects

In March 1967, through agreement with the Editor of THE JOURNAL OF ORGANIC CHEMISTRY (JOC), CAS started indexing the primary manuscripts simultaneously with their editing by the Publications Division's editorial staff. Using copies of the accepted manuscripts, CAS identifies those chemical compounds which will later be recorded in CA volume indexes when, following their appearance in JOC, these papers are abstracted in CA. The Registry Numbers corresponding to these compounds are forwarded to the Publications Division's editorial staff for inclusion with the original papers in the JOC issues.

The JOC experiment illustrates the interlinkage provided to the information consumer as a result of CAS's establishment of the Chemical Registry. The printing of Registry Numbers within an original paper makes possible, through the Registry, the identification of other papers dealing with the same chemical compounds.

The JOC-CAS joint development project is addressed mainly to the handling of compounds. A more general primary-secondary subject indexing interlinkage is being developed through a similar process for manuscript indexing. The ACS primary publications staff and the CAS staff are exploring the possibility of creating volume indexes for primary publications by an automatic extraction of the appropriate index entries from either the Primary Publications Production files or the CAS Production files, whichever is the more advantageous.

An even more direct linkage to secondary indexes is

possible for the approximately 250 publicatons which contribute 50% of the journal papers covered in CA. For these, CA index references could lead directly to the primary publications instead of to CA abstracts. This, in turn, suggests either the elimination from CA issues of abstracts corresponding to such primary publications or, more likely, the reduction of corresponding CA abstracts to only the titles and bibliographic citations of the papers.

CAS is shifting toward supplying all of its computer-readable services and files in a single Standard Distribution Format (SDF) for ease of use, interchange, or interlinkages. As the individual islands of processing activity are extended by continuing development, they must be interconnected. Such interlinkages require that each of the processing segments being directly joined must be compatible with the others in its handling of the data processed through the extended system. The problems of consistency were not great when the first segments of the system were interlinked, but the contiguous portions of the system are now so extensive that the full range of ACS processing concerns must be studied before additions or changes in the system are made. Making these studies has required creation, within the R & D area, of systems engineering aids and automated documentation management aids and the installation within the operations area of a scheduling workflow work standards group.

A major development program now being carried on between the Chemical Society (CS) of London and CAS illustrates the potential for cooperation between non ACS primary publications and ACS secondary services. CHEMICAL AND ENGINEERING NEWS reported on this

project in the article entitled, "ACS, British Link Information System" in the issue dated April 28, 1969. A fulltime CS editorial staff member spent a year with CAS establishing a written set of guidelines for the identification of information input for the CAS system within the routine editorial processing stream for CS journals. The guidelines focus on the identification of the items which will go into CA subject indexes rather than on their conversion into standard index entries. With the basic chemical journals, the indexing, which is carried out directly upon the original journals, requires the greatest part of the data analysis effort. As a pilot project, CS is now sending CAS marked copy from the Journal of the Chemical Society, Section C, Organic Chemistry, for completion of the indexing in Columbus. Should this pilot project be successful, the guidelines will be revised in accordance with the experience gained and the range of CS input will be extended as rapidly as staff can be trained.

Marketing Plan

An overall objective of the ACS is to provide the widest possible distribution of its publications and services consistent with economic viability.

CAS Marketing Department

This Department markets all ACS secondary publications and services. It seeks to place these publications and services in every institution where access to chemical information is essential. The Department's responsibilities include market data collection, direct mail promotion, space advertising, and personal sales.

As computer files with potential use in the scientific community are established, the Department makes arrangements with interested institutions, information centers, and agencies to experiment with tapes from the files. Both Basic Journal Abstracts (BJA) and CA Condensates resulted from experiments set up on this basis.

Making such computer files available for experimentation will help to achieve the maximum useful extension and distribution of computer-based services. The ACS is now actively working with various U.S. and overseas organizations to develop publicly-supported centers capable of using computerized chemical information, in addition to the existing centers already experimenting with CAS tapes. In return, the recipients of these tapes provide to the Society useful guidance in the continuing development of the system.

New forms of information service require a variety of distribution techniques, some of which are new to the Society. Personal selling and operational demonstrations appear to offer the most practical approach. Outside the U.S., the ACS has entered into joint marketing programs with the Consortium on Chemical Information of the United Kingdom and with the Gesellschaft Deutscher Chemiker in Germany. Through the joint programs, these organizations assume full responsibility for marketing ACS secondary services in their respective countries. Negotiations with several other countries for similar arrangements are currently in progress.

In developing the new distribution techniques, CAS will shift from the single-product focus on CA and the CA Collective

Indexes to the whole family of CAS publications and services. As the entire ACS data base develops the need for multiple access to the wide range of available primary and secondary publications and services will be emphasized. The value of larger or combined secondary information packages will be stressed, while custom searching and specialized services and publications will become the responsibility of information centers among which can be included ACS primary publications, data programs and other services. Pilot publications such as Chemical Biological Activities and Polymer Science and Technology will continue to be produced for special subject areas, but the number of such services will not be increased except as a natural consequence of the increased size and range of content of established CAS publications and services. The use of multiple copies of "overrun" publications such as CA or CA Section Groupings to supplement or replace a subscribing organization's private abstract bulletins will be promoted.

Discipline-Oriented Secondary Services

Close cooperation and coordination among the secondary services of different disciplines is an essential for an effective approach to reduction of duplication of effort and interchange of information between disciplines. The rapidly increasing integration of subject matter across the full range of science and technology means that the collective contributions to the published record will have an ever increasing diversity in terms of the range of disciplines represented.

Each discipline-oriented information store is organized along the line of the subject matter of that discipline. To be

complete, each discipline-oriented information service must cover many documents that deal with information of concern to other disciplines as well as its own. Often such coverage includes documents in which most of the information is of concern to other disciplines and relatively little is of concern in the discipline of the given service. For example, CA covers less than 250 primary publications completely. On a twelve-month basis about 90% of the CA nonpatent coverage comes from 2,000 primary publications with the remaining 10% coming from about 5,000 others. In a five year period, the range of journals covered grows to 13,000. Obviously the fraction of information of interest to chemistry is small in a great many of the journals with articles abstracted in CA, and obviously many of these journals are covered by the information services of more than one discipline.

Coverage overlap leads not only to duplicative abstracting, but also to duplicative indexing. If one assumes that discipline-wide abstracting and indexing services are intended to provide the same level of access to information and if the data extracted by a secondary service from an original document reflect the content of the original paper as viewed by an expert, then the abstracted data are slanted toward the focus of the original document and not specifically toward any one discipline. In indexing the individual concepts within a given abstract must often be rephrased. In rephrasing for the index, not only is the jargon changed to conform with that of the discipline toward which the index is directed, but those details of the concept which correspond most closely to the concerns of that discipline are also given precedence in formulating

the index entry. Thus, when the indexes of two disciplines cover the same paper, both will usually focus on the same concept, although the hierarchy and terminology of each index will favor the specific discipline toward which it is directed.

This situation leads to inconvenience for the information user when he must utilize indexes from two or more services centered in different disciplines. These services may be fully independent, partly coordinated, or fully coordinated.

If the appropriate information is to flow into an organized, discipline-oriented data base and remain retrievable, and if the discipline-oriented services cannot independently afford to process the full range of potential primary source documents, then there should be a division of primary information among the secondary services. Only then can there be well-coordinated, single coverage of the primary literature. This cannot occur until effective two-way linkages can be built between the secondary services to permit the information user to shift from one to another. When this happens, the overall rate of growth of the literature and the rate of buildup of secondary processing costs can be brought into balance.

Chemical Abstracts Service Division

Research, Development, and Implementation Objectives 1970-1975

1970 1. Install CA Subject Index 2280 Publication System

2. Introduce Parent Compound Index

3. Pilot Input from the United Kingdom and West Germany

4. Introduce Registry Number Index

1971 1. Install Unified Pilot Publication System for Producing BJA, CBAC, CT, CAC, CA Issue Subject Indexes, POST-J, POST-P

2. Adjust Registry Records to Simplify Automatic Nomenclature Generation

1972 1. Compose First CA Issue Sections through 2280 System

2. Design, program, and install computer-based pilot management information system in CAS operations

3. Divide CA Subject Index into General Subject Index and Substance Index

4. Implement pilot computer-readable input from the United Kingdom and West Germany

1973 1. Complete Publication of the Eighth Collective Index

2. Install Direct-Access Registry Pilot

3. Initiate routine computer-based structure display in Registry Processing

4. Initiate input to the Registry of substances identified in pre-1965 CA Subject Indexes

5. Pilot Computer-Readable Abstracts from Publications Division

1974 1. Full-scale input in computer-readable form of abstracts and fully standardized index entries from United Kingdom and West Germany

2. Initiate full-page composition including structural diagrams

3. Design and implement full-scale computer-based management information system in CAS operations

1975 1. Start installation of Direct-Access Registry System

2. Pilot direct interlink of primary and secondard computer-based processing systems

3. Complete shift of all CAS keyboarding operations to systems based on computer-supported, on-line editing

In addition to the objectives outlined by year, CAS will conduct investigations throughout the period of techniques and procedures necessary for direct access capability in appropriate applications and will be working toward an interactive interface with other information systems.

THE PRIMARY PUBLICATIONS OF THE AMERICAN CHEMICAL SOCIETY

No individual today can read all of the chemical literature; few can read all that pertains directly to their work. But the competent scientist should become well acquainted with much of the knowledge that is available to him for his own subject area. The reading needed to keep the scientifically trained person adequately informed might be divided into three levels: (1) the highly detailed reports in the primary journals, which keep one well informed in the chemical area of one's specific competence; (2) survey and review material which enables one to maintain a good knowledge, although not necessarily highly detailed, in broad areas related to one's own field; and (3) general scientific and technical news which affords a sense of the movement of events in the total field of chemistry-based activity.

The ACS Publications Division serves all three levels. It receives some 11,000 original research articles per year, from which it publishes about 7000. Although this is less than 5% of the world's chemical literature, it is some 15% of U.S. primary chemical information and contains an even higher percentage of the significant new work reported in the American chemical literature. This reflects the large circulation of the Society's journals, the high standards of physical presentation employed, and the operation of a quality screen through critical review of each manuscript by at least two experts in the field of the manuscript.

The 7000 articles are published in 18 journals, including

two devoted exclusively to reviews. The 18 journals publish some 40,000 pages per year, have a combined circulation of almost 200,000 and are used by countless thousands of others through libraries and pass-along lists developed by some subscribers primarily institutions. Two other publications, CHEMICAL AND ENGINEERING NEWS, the Society's news magazine, and CHEMISTRY, designed to serve the serious beginning student of chemistry, are discussed separately (see pages 6-14, 15).

Although the Society has introduced new publications from time to time and has experimented with and adopted many processing and production innovations, its primary publication system has not changed in principle. Its journals continue to depend primarily on author-created manuscripts, screened for quality, printed on paper, bound into issues, and mailed periodically to individual subscribers (many of whom, of course, are libraries and other institutional representatives). This form has been central to scientific communication for more than 300 years.

By virtue of sheer volume, high costs, and changing patterns of scientist behavior, this system, efficient as it has been, shows signs of reaching its limits. Recent price increases, for example, apparently caused some 5% of the individual subscribers to cancel subscriptions, and further price increases, some already scheduled and others anticipated if the structure does not change, will undoubtedly strain both the economic basis of the journal system and the effectiveness of dissemination of chemical information. Obviously, some changes in structure are essential.

The combination of current awareness and archival functions served by the primary literature imposes some constraints on the Publications Division. To fulfill the current awareness function requires attention to variables analogous in nature to many of those faced by planners of meetings, where human factors are as important as objective factors. The archival function, on the other hand, can be considered on a more objective level, and it is in this area that the Publications Division and Chemical Abstracts Service Division have much in common.

Specifically, the Publications Division finds it necessary, in gathering material for publication, to deal with standards of symbology, nomenclature, format, and the like that accord more with human behavior than with production economics. In its evaluation process--primarily where original research publication is concerned--the Society at any given time must accept the standards of the profession as to what constitutes publishable information and how much of it must go into the permanent record. Although the Society can and does influence those standards, changes are slow in coming, since the problems of implementation of change relate to the response mechanisms of people rather than of systems.

In the production system, as well, the Publications Division continues to recognize the traditional freedom of the individual author to check his manuscript "one last time" before it goes into the permanent record--he does this by reading galley proofs and making corrections in both substance and format. Although usually not major in either number or extent, these corrections save many later corrections, but they make machine-processing of the information considerably more expensive than if the step were omitted.

In package design, the Society must recognize the effect of typography, page format, illustrations, tabular design, and other subjective factors on the individual recipient's decision as to whether to read the paper and thus permit information transfer to him to occur. Again, as with meetings, if these variables are not dealt with effectively, the chemical community will respond with less willingness to participate in the service, and thus the objective of information transfer will be less well met.

Despite these constraints, there are numerous opportunities for the Publications Division to operate its manuscript handling and journal production systems in such a way that its processing steps can interface with, replace, or be replaced by appropriate steps within the Chemical Abstracts Service Division. In addition, the Publications Division is studying various ways through which the journals' awareness and archival functions might be separated, thus permitting processes, products, and services to have components that fit more readily than at present into the computer-based system under development.

The Publications Division plans to develop its computer-based production capability in such a way that its output where appropriate will be usable by CAS and other secondary processors of information, while maintaining and enhancing Publications' ability to serve other identified needs of its users. In one sense, Publications already serves as an "input Center" to CAS for it delivers abstracts for about 70% of its articles in such form that CAS can use them directly. But this arrangement is manual -- that is to say, the abstracts are not delivered in machine-readable form, nor does the Publications Division yet interface computerwise with CAS in any aspect of its operations. A first step is to

prepare for changing this manual relationship to a computer relationship. This requires the cataloguing of specific requirements in character sets, keyboarding, file organization and maintenance, executive and search routines and output typography, economics, and page format. From this evaluation will derive a set of requirements related uniquely to each division. When this stage is complete appropriate reassignment of responsibilities will be considered.

After this stage has been completed, the Publications Division will begin to exchange with CAS computer-readable information being processed for primary publication. This will be done not only to speed the material's inclusion in CHEMICAL ABSTRACTS but also to study the application of the Chemical Registry system to manuscripts in process, to study indexing by CAS criteria during manuscript processing and to develop a manuscript numbering and control system applicable to both Divisions' needs. A longer range objective will be to computerize parts of the review process--particularly with regard to selection of reviewers and to provision by CAS of citations to information already in the CAS data bank relevant to the reviewers' judgmental and evaluation process. This might include published work not cited by the author and, eventually, notification to the reviewer of articles in process of publication whether by the author or by others.

In addition to capitalizing on CAS's computer capabilities and speeding appearance of abstracts in CAS services, these programs will serve as prototypes for other publishers of large amounts of scientific information and will improve the quality of

primary publication both through increased speed and reduced redundancy of publication.

The Publications Division will carry out further programs designed to enhance the flow of primary information by improvements in the publication process and by provision for publications and services more directly related to user needs than are now available.

The development of computer-based systems of handling primary information was started upon evaluation of computer-oriented composition systems able to handle all the complex requirements of scientific manuscripts. Out of these efforts emerged results and design data which support movement toward development of a highly flexible and unified manuscript encoding system programmed for the present generation of computers. The procedures developed by the ACS have been previously described. They include, for example, computer-based techniques for keyboarding of textual information, chemical structure diagrams, and mathematical expressions as well as the hyphenation and justification routines required in the composition of chemical text. These procedures are being tested and refined in a pilot production system that now handles the regularly scheduled production of four journals -- JOURNAL OF CHEMICAL DOCUMENTATION, JOURNAL OF CHEMICAL & ENGINEERING DATA, I&EC PRODUCT RESEARCH AND DEVELOPMENT, AND I&EC PROCESS DESIGN AND DEVELOPMENT.

An immediate goal of the Publications Division is an economic analysis of its computer-based composition system as a basis for extending the system to all of its journals. Even with favorable economics there are many areas where further development is indicated.

Developmental effort will continue on the system, particularly in the areas of on-line editing, chemical structure setting, handling of mathematics and graphs, keyboarding techniques, and character representation. All these projects will provide data useful for scale-up of the computer-driven composition system for all the Society's journals as determined by economics.

Preliminary work will also begin on longer-range programs, such as computer-assisted manuscript flow control, direct editor-computer interaction during editorial production, establishment of production and archival files, including file format for primary chemical information, and development of a search system for these files.

Although many of the potential advantages of the computer in schemes for selective dissemination of information, specialized journal packages, and the like are clear, the optimum manner in which to capitalize on them for dissemination of primary chemical information is not yet clear. Hence, the Division will continue to study the need and use of primary information, study and test repackaging of existing products to provide improved service to users, and develop and test new products and services to better meet user needs. The Division also will develop a bank of computer-readable primary information and make it available to the chemical community for study of how it can be used to advantage and how it should be organized for those uses. It will continually monitor the response of the chemical community to all its primary information packages, both traditional and experimental, to ensure that the developmental program in information package design takes into account the reactions of the users of the in-

formation, both individual and institutional.

In 1969 and 1970, the Division made a test run of Single Article Service, a program by which the tables of contents of the Society's research journals were reproduced and distributed to a sample of the membership. The recipients could order reprints of any articles listed. Periodically, the recipients were surveyed by questionnaire as to their reactions to the program. At the end, a test promotional campaign was launched, in which variables such as price, combinations of services, and interactions were tested. Although the data analysis is not yet complete, preliminary results indicate that the service would be useful and financially viable.

The Publications Division plans to incorporate the present Research Results Service into the Single Article Service and thus add the availability of manuscripts not yet published. This service is now limited to the three I&EC quarterlies, but it is worth considering expansion of this feature to include other journals. Another feature slated for test involves providing abstracts in addition to titles, to see how this affects the user's ability to locate articles relevant to his interests and his work.

The Single Article Service is not regarded as an end in itself; the major goal is to explore the full range of possibilities in using single article availability as a means of putting a more selective and relevant set of documents into the user's hands. Current research is directed toward the classification problems encountered in developing group profiles. As a starting point the Publications Division staff is

using the subject clustering patterns revealed by the SAS data. The next phase will be a test of these profiles on a user sample as a basis for providing copies of articles and possibly for guidance toward repackaging ACS journals into more selective groupings.

As to establishing new journals, the Society has a well defined mechanism for divining the extent of interest. This mechanism is to ask the aid of its membership, through its scientific and technical Divisions and through the Council Committee on Publications. For example, the Division of Water, Air, and Waste Chemistry provided the critical input needed to support the decision to establish ENVIRONMENTAL SCIENCE AND TECHNOLOGY. The Council Committee has the responsibility of speaking to the decision-making bodies of the Society concerning overall information needs of the members, whereas the Divisions speak to the same bodies from a more specific range of interests.

Regarding use of primary information by scientists, the Society has monitored the purchasers of its journals for many years, noting which individuals and institutions purchase which journals, and how price increases affect their willingness to purchase the publications. For almost 20 years, these data have been supplemented by periodic surveys of subscribers to various individual journals, to determine readership behavior. Among the variables studied have been readership as a function of the individual's title, function, and personal background, the nature of his employment (industrial, academic, or government), the nature of the item being read (subject, editorial treatment, its location within the publication, and the illustrative material

accompanying it), as well as other factors.

From all these studies, the Publications Division has gained some understanding of how primary information is received and how to increase or decrease its reception. Still to be learned, however, are the effects of such considerations as volume and scope of material on an individual's willingness to invest his own funds for subscribing, the factors describing an individual's interest ranges, and how much irrelevant material an individual will accept to get relevant material. The broad generalizations that Publications can now make concerning these factors are as yet not sufficiently precise to support with confidence any particular decision to change journals radically.

The Publications Division has maintained a continuing liaison with the Council Committee on Publications over the past several years, as the Committee's thinking on modification and extension of the journal system has developed. For example, it participated in the development and analysis of a recent major survey of THE JOURNAL OF ORGANIC CHEMISTRY and is currently considering such matters as the role of Communications in journals, unification of editorial style insofar as style relates to the communicability of the primary information, the definition of minimum necessary article length, the role of page charges, the role of reprints, and the probable effects of future subscription price increases on individual subscribers' continued willingness to subscribe.

The Publications Division plans several more surveys in depth over the next five years designed primarily to generate insight into questions about who will pay how much for what. It

is testing the willingness of authors to prepare shorter articles through a program being headed by an Associate Editor of THE JOURNAL OF ORGANIC CHEMISTRY.

The growing acceptance and use of the microfilmed versions of ACS journals suggests that extension of the microfilm service offers a basis for a constructive solution to some of our problems. Direct microfilming of typed manuscripts is now under consideration by the Publications Division. Such papers would be promptly abstracted and indexed on the same criteria as papers published in the printed editions and thus facilitate searching of the microfilm archive. The rapidly improving quality of microfilm reader-printers makes possible ready availability in hard copy of any article the user would care to have in hand or in his files. The cost-benefit relationships, both with respect to reduction of costs (as against the printed journal system) and the reduced time between acceptance of the paper and availability to its users, will be critically studied.

The Division is now in the process of establishing a Society-operated microfilm depository for material deemed worthy of preservation in the archives but considered to be of interest to so few scientists that its being printed in standard journal form is not justified on a cost-benefit basis in comparison with direct incorporation into the microfilm version. The supplementary material to be included in the microfilm edition will be made available to CHEMICAL ABSTRACTS for use in abstracting and indexing. This program is considered a possible first step in providing full-paper availability in a system of short-paper publication aimed at better meeting the needs of a large groups of individual subscribers. The full-paper version would meet the needs of institutional subscribers and also individual

needs through such devices as the Single Article Service.

Audio and Audio-Visual Transmission of News and General Information

The Publications Division has undertaken developmental work in the transmission of news and general information through magnetic tape cassettes. At the present time, costs are still a hindrance, but acceptance of the idea and appraisal of the content of the first efforts on industrial news have been good. Extension to research and technical news, as well as audio tape reporting of oral presentation of papers and seminars (see page 7-15) is in pilot plant stage with the first offerings being prepared.

Rapid developments in the video field suggest that in a matter of a few years the technology and costs of equipment may be such as to make video transmission of scientific and technical material a practical possibility. This is being studied by the Publications Division, with one video tape production (a panel discussion on environmental quality) already available to the chemical and general public, another in production, and others being planned. The rapid development of cartridge television and similar mechanisms suggests very attractive possibilities, which the Publications Division is now studying.

Also included in Society plans is development of a series of journals tailored to groups through profile matching. Surveys and other data on reader behavior, along with test distribution, will determine the nature of the content and the number of such journals. As more understanding of the variables is acquired, this program is scheduled for gradual implementation in 1972 and thereafter, following analysis of the further surveys planned to be made in the interim.

Review, Evaluation, and Compression

The Publications Division, in addition to its role as disseminator of primary chemical information, has several other functions, as indicated earlier. It publishes reviews of various types, evaluates and compresses information, and is studying entry in an organized way into the field of chemical data, as distinguished from chemical information, of which data are only a part.

The Society publishes two review journals, CHEMICAL REVIEWS (comprehensive surveys of the literature and the state of tne art in subject areas that, for each article, are relatively narrow) and ACCOUNTS OF CHEMICAL RESEARCH (critical timely reviews at the current frontiers of research). In addition, reviews also appear in other journals, including ANALYTICAL CHEMISTRY, which publishes a special issue of Annual Reviews each April; C&EN, which publishes a number of review articles in fundamental and applied chemistry as part of its features program, and INDUSTRIAL AND ENGINEERING CHEMISTRY. The latter journal will suspend publication at the end of 1970, when these reviews will be transferred to the appropriate I&EC quarterlies, while the Annual Reviews also published in I&EC will appear in book form, starting in 1971.

Some review articles appear in numbers of the ADVANCES IN CHEMISTRY SERIES, when the reviews are part of the symposia published in this series. ACS MONOGRAPHS, which had been an ACS sponsored book series, became a Society publishing activity in 1970 intended to generate high level treatises in various fields of chemistry. Under this Plan, the Monographs series will broaden

its scope somewhat to include volumes on the chemistry-society interface, as in the matter of pollution.

In the data field, the Society has published JOURNAL OF CHEMICAL AND ENGINEERING DATA since 1958, has included three volumes of azeotropic data in ADVANCES IN CHEMISTRY SERIES, and is planning to extend its effort in the data field as appropriate and as funds permit. These plans include use of the Society's machine-readable data base and the expertise of its membership.

The Society also conducts, under the Committee on Chemistry and Public Affairs, analytical and interpretive studies on chemical science and technology as related to major public problems and issues. Reports of these studies are published in book form. The report, "Cleaning Our Environment - The Chemical Basis for Action", published in 1969, was the first of this type completed by the Committee. A current study, "Chemistry in the U. S. Economy", will be completed under this plan.

News and General Chemical Information

Just as members of the literate general population find newspapers and magazines valuable, so there is a place in the lives of technically literate people for something comparable serving their professional needs. Material in CHEMICAL AND ENGINEERING NEWS is designed not to teach the specialist in his own field but rather to inform him accurately, reliably, and promptly of the happenings of broadest importance to the chemical world. C&EN's full-time staff of technically trained editors gathers, evaluates, and presents to readers a highly current selection of news. It is probably unique on one score -- that of editorial reporting in news style to a scientific and technical

audience on new developments from research laboratories. Such reporting requires special care. Therefore, C&EN uses qualified outside advisors in selecting research topics to be reported and thereafter seeks critical evaluation of what has been written, much as the fundamental science journals do. In addition, the final version of any research story is checked by the research worker from whom the information originated.

While more than two-thirds of C&EN's subscribers are employed in industry, not all of those have their primary interest in the business or economic aspects of industry. The content of C&EN is about one-third industrial in the business or economic sense, while the magazine's editorial balance is in general related to the distribution of the interests of its readers.

Until recently, little attention was paid to the secondary school student insofar as detailed science was concerned. Now, however, the intensity of the educational process is such that considerable numbers of secondary school students are able to grasp science presented in a serious fashion. To serve this appetite and to encourage it, the ACS publishes a magazine called CHEMISTRY directed to the competent student in the secondary school and to his teacher. Through clear, simple, but scientifically sound discussion of important areas of advancing knowledge in chemistry, CHEMISTRY gives the student a feeling of being in close contact with the vital activity of science. This publication is receiving enthusiastic cooperation from leaders in chemical science in preparing solid, thoroughly up-to-date material. Special attention is given to creating illustrative material designed to aid and stimulate the student.

Another gap in the Society's publication program--the service to a large number of chemically trained people using chemical information as a means of producing, improving, and developing products and processes rather than creating new chemical information--will be rectified in 1971 with the creation of CHEMICAL TECHNOLOGY. This publication will place research developments into the context of process and product development and will also deal with ways to accommodate chemical requirements with the other requirements of innovation. It will be made available on a subscription basis to the chemical community outside the Society, and to members on a complimentary basis for several months to acquaint them with its content as rapidly as possible and to assist them in their decision as to subscribing. Experience shows that many individuals will become more rapidly aware of and benefit from the publication through introduction in this manner, and that the high initial cost of introduction will be more than compensated for over the first several years by rapid stablilzation of paid circulation.

In summary, the Division is constantly working toward a publications system that will (a) enable all professional people whose work is based on chemistry to remain well informed at whatever level their needs require, (b) provide scientists at all levels with both a general awareness of the growing body of chemical knowledge and the means to obtain detailed information on any part of it, and (c) buttress the technical awareness of public officials, non-technical administrators, and others who must deal with public problems at one or more steps removed from direct involvement with the pertinent science and technology.

ACS Publications Division

Research, Development, and Implementation Objectives 1970-75

1970

1. Evaluate Single Article Service (SAS) for 1971 Introduction
2. Study SAS Subject Clustering Patterns Preliminary to Developing Group Profiles
3. Develop Prototype Short Papers for Publication in JOC and Measure Response
4. Convert Pilot Production System (4 Journals) to IBM 360 Composition
5. Evaluate Chemical Executives AudioNews
6. Record on Experimental Basis a Range of Symposia at Fall National Meeting

1971

1. Pilot the Single Article Service and Measure Response
2. Introduce CHEMICAL TECHNOLOGY and Measure Response
3. Develop Group Profiles from SAS and other Data on Subject Clustering Patterns
4. Study Feasibility and Economics of Group SDI Based on Subject Clustering
5. Continue Analysis of User and Author Response to Prototype Compression of Journal Articles and Extend Analysis to Related Matters Such as Communications
6. Catalogue Systems Requirements, Compare with Those of CAS, and Establish Elements of Commonality and Difference
7. Study Economics of Extending Pilot Production System to Additional Journals
8. Study Input and Output Devices Preparatory to Establishing Editor Interaction with the Data Base
9. Study Indexing Methodology and Requirements

1972

1. Extend Pilot SAS to Include Selective Dissemination
2. Design Prototype Group SDI Journals
3. Implement and Evaluate Short Paper Experimental Publication
4. Continue Studies of User Needs and Values
5. Develop Specifications for Machine Input to CAS

6. Study Representation of Specialized Characters, including Mathematics and Graphics

7. Study On-Line Editing by Editors

8. Develop Specifications for Computer Assisted Manuscript Control System

9. Develop Indexing Methodology

1973 1. Develop Cost Effectiveness Measures of User Needs and Values

2. Introduce Prototype Group SDI Journals and Evaluate Response

3. Pilot Interlink of ACS Pubs with CAS for abstracts in machine readable language

4. Design Automated Single Article Dissemination

5. Improve Math, Chemical Structure and Other Graphics Setting

6. Study Remote Editing Journal Production System

7. Implement Computer Assisted Manuscript Control System

8. Develop Specifications for Computer Assisted Reviewer Selection

9. Study Interface Archive System

1974 1. Apply Cost Effectiveness Measures of User Needs and Values to Information Package Design

2. Implement Remote Editing Journal Production System

3. Design Interface Archive System

4. Implement Computer Assisted Reviewer Selection and Indexing

1975 1. User Needs Requirements

2. Interactive Journal Editing System

3. Test Interface Archive System

PRELIMINARY CONSIDERATIONS FOR ACS MEETINGS

Meetings have long been an integral part of the scientific communications process, but experts differ in their opinions as to how important meetings are and how they might be improved. Most quantitative studies made to date lead to the conclusion that at least 50% of a scientist's information comes from personal discussions, including meetings of various sorts, and much of that comes from the unstructured portions of the meetings.

The ACS objective for meetings is to provide opportunities for interpersonal contacts, arranged to facilitate the exchange of chemical and related information. They should be of such a variety that the entire chemical community, including the basic researcher, the applied technologist, and the administrator, whether from government, industry, or education, can make use of these opportunities.

To fulfill these needs, the ACS sponsors an extensive program of meetings. In addition to membership-wide meetings of the Society (referred to as National Meetings), there are hundreds of other meetings, sponsored by individual ACS Local Sections, groups of local sections in "Regions," and scientific Divisions. Also, the ACS and its subunits participate in, or jointly sponsor, meetings with other societies. Meetings are an important part of the informal information system of science for they offer many opportunities for the interchange of ideas among scientists. Like other parts of the overall ACS information system, however, meetings are coming under increased scrutiny to determine how they can be made more effective.

Types of Meetings Sponsored by the ACS

National Meetings--The ACS National Meetings are held twice yearly, in the spring and in the fall. Each attracts from 6000 to 14,000 registrants, with some 1400 to 2400 papers (Table I Appendix C). The National Meetings feature contributed papers and a variety of special symposiums, panel discussions, and grouped presentations organized mainly by ACS scientific Divisions. Moreover, the National Meetings are occasions for business sessions of the ACS Board of Directors, the ACS Council, and countless committees, through which the Society conducts its affairs. These meetings also feature short courses, demonstrations, exhibits, an employment clearing house, awards, and other activities of the Society.

Regional Meetings--The ACS groups its local sections into ten geographical regions (see Figure I Appendix C), all of which sponsor region-wide meetings, generally as often as once a year. Such meetings tend to be smaller versions of National Meetings, with emphasis on contributed papers and symposiums. Sometimes Regional Meetings are held in conjunction with an ACS Division or with one or more other societies. The total annual attendance at Regional Meetings ranges from 5000 to 7500 persons (Tables II and III Appendix C). These meetings collectively have about the same number of papers as are delivered at a single National Meeting.

Divisional Meetings--Although the main meetings of ACS Divisions are held at the National Meetings, several of the Divisions independently sponsor scientific and technical meetings

or symposiums at other times of the year (Tables IV and V Appendix C). Attendance figures vary from less than 100 to nearly 1000.

Local Section Meetings--Typically, an ACS Local Section sponsors monthly meetings, at each of which a single speaker makes a prepared presentation. The larger sections, however, often organize simultaneous technical sessions, usually with the sessions corresponding to Divisional interests. Meetings may involve a short business session to discuss section activities, and dinners often are held prior to, or between, the lectures (see Table VI Appendix C).

Other Meetings--There are a number of meetings involving chemistry that are not held under ACS sponsorship. Some of these have no connection whatsoever with ACS, while others are sponsored in part by groups affiliated with ACS, often through Divisions or Local Sections (see Table VII Appendix C).

The Needs Meetings Fulfill

ACS and others--notably the American Psychological Association and a number of psychologists and sociologists--have investigated the needs that meetings fulfill and the roles they play in the lives and careers of individual scientists. Generally, meetings serve needs in two categories, technical and professional. Among technical needs are the following: informal exchange of facts and ideas in a scientist's own field and, where pertinent, in other fields; the gaining of an overview, particularly by younger chemists, of the active discipline of chemistry and emerging areas of interest; acquisition of background and ideas in new areas of technology. Among professional needs are the

following: centralized interchange of information on employment opportunities and job seekers; meeting with other chemists; public communication of ideas and accomplishments to peers; evaluations of others, and recognition of leaders in various fields.

At meetings the membership has the opportunity to carry on the business of the Society. In addition, meetings provide a mechanism for interaction between the organized chemical community and the public in that they offer a public platform for discussion of chemistry's contributions and its problems. Such meetings also provide both an informal and a formal format for debate and the formulation of chemical community opinion on public issues. Meetings are also a means for demonstrating to the public and, perhaps equally important, to chemists the relationship of chemistry to the solution of general public problems.

Current Position

An analysis of the accompanying data (Appendix C) concerning meetings of the Society and its branches shows that the number of people attending them has begun to level off, if not to decline. The number of papers presented has grown steadily over the past decade, but the number of attendees per paper has declined consistently. It now appears that even the totals are leveling off both for papers and attendees. Some people anticipate further declines in both during the next five years, but the consensus within the Society is that the level of activity will probably remain fairly stable at current levels.

It is clear that the number of attendees has not kept pace with the increase in the number of members in the profession. In this regard, the data are similar to those of the Primary Publications, for which numbers of subscribers have increased at rates lower than that of Society membership. Until 1969 membership grew at approximately the rate at which the number of qualified chemists grew. In 1969, and again in 1970 (when the Society's increase in membership dues had a significant effect), the ratio of new members to those newly qualifying for membership declined.

These data indicate that the Society's current posture with regard to meetings may lead to a state of affairs that falls short of the objectives. In late 1969, the Office of Informal Communications and Divisional Activities was established to deal with the problem.

Study of the available data from both information scientists outside the Society and ACS records has led to several tentative conclusions.

The motivation to attend a technical meeting is the subject of considerable complexity which depends upon individuals. Actual attendance at a meeting is governed not only by motivation but also to a large extent by financial considerations.

Results of most studies and surveys indicate that formal paper presentations, especially contributed papers on narrowly specialized topics, are of limited actual value, although such papers may be the central concept around which the meeting is organized and the justification used for attendance by many. Well organized sessions of broad general interest presented by recognized scientists in the field generate a great deal of

interest. In all programs there is a need for greater quality.

Probably the most important aspect of meetings besides the program itself is the contact between individuals in informal discussions, whether over coffee, in the bar, or in the hotel lobby. The verbal exchange (including letters and unrefereed manuscripts) of information is believed to account for 50 - 60% of the scientist's information input. Meetings serve to bring together individuals with similar interests, thus leading to informal exchanges, as well as to the establishment of new contacts.

The Society has defined goals in a number of areas where consistent attention and continued study would be of benefit. In order for the Society to measure progress toward those goals or to assure that our meetings and conferences are fulfilling some of those goals, the staff must establish and maintain a continuous monitoring of the Society's meetings. Thus staff will continue to identify and develop measurements for those parameters that determine the success of a meeting or conference (for example, quality of content, number and type of attendees, and effectiveness of informal communication). Also, the staff will apply understanding of the factors influencing meeting effectiveness on the design of subsequent meetings.

It will be advantageous to coordinate the activities of the Society's scientific meeting programming entities so that redundancies are minimized and subject coverage is comprehensive--for example, by redirecting Divisional effort into Regional and small conference center meetings. The economics and logistics of informal communication make it desirable to develop

a group of regional conference centers placed so as to maximize the opportunities for individuals to attend meetings at minimal travel costs.

A mechanism must be created to deal as necessary with situations where a subject becomes worthy of treatment at a meeting after normal deadlines for preparation of plans and content have passed. With the growth and overlap of each of the basic sciences, we must prepare to extend the range of programming activities into interdisciplinary subject areas as rapidly as the value of chemical information in those areas can be identified.

Initiation of the planning and development of programs necessary to fulfill these goals is the responsibility of the Office of Divisional Activities and Informal Communications within the Membership Division. A schedule for this program development is included on pages 7-17 - 7-19 If the proposals concerning the restructuring of the meetings prove successful, it will be necessary to provide coordination for not only the planning of the programs of the national meetings but also for those programs of the regional meetings. This could require full time permanent staff support. Since meetings constitute a membership activity primarily expressed through the technical divisions, it will be necessary to provide a mechanism for direct membership input into staff planning and coordination. In the initial stages of the program the Society will assign staff to help realize these goals.

Evaluation of Current Situation

There has been growing concern expressed as to whether or not the current meeting programs of the ACS truly reflect the

needs of the membership in providing a forum for meaningful interpersonal communications. There are many reasons to believe that they do not. Probably a single most often heard criticism is that of the quality of the meeting programs. Second is the lack of enthusiasm for many of the locations in which the large meetings have to be held. This is associated with a third criticism which is that of size. The last two criticisms are directly related to a fourth which is that of quality of the facilities. In addition, there is also a general concern for the increasing costs of attending meetings, particularly that of room and board and transportation.

It was in response to these criticisms that the ACS felt the need to undertake a program to review the situation with respect to its meetings. In order to understand some of the conclusions which have been drawn, it is worthwhile to amplify further on several of the factors mentioned above.

Program Quality--There is a feeling among many that the 15-20 minute contributed paper is responsible for a great deal of the criticism of program quality. Many of the reasons for presentation of a paper, such as a "ticket" for attendance at a meeting, a mechanism for author recognition, the establishment of a record which will be used for promotional purposes, etc., have nothing to do with and do not contribute to a meaningful exchange of information. Many of these papers are poorly attended and the material presented is found to be trivial. It is also felt that even symposiums, with the invited or solicited papers, do not represent sufficient concern for the material presented.

Another aspect of the problem is the fact that many of the recognized leaders in chemistry do not attend ACS meetings, either at the national or regional level. This raises the question as to whether or not sufficient emphasis is being placed on the ACS image both in the scientific community and with the public at large. Again, this reflects a problem of program quality. If meetings do not attract a significant cross-section of the recognized leaders in the various fields of chemistry, then they do not provide for the exchange of that information which is both current and significant. Since it is the interpersonal contact and exchange and usually not a scheduled paper which is of most importance to the attendees, it is necessary that a meeting provide for interaction among individuals representing all levels of maturity and competence in their fields.

Location, Size, Facilities, Costs. The large meetings such as national meetings present a particular difficulty as far as location, facilities, and costs are concerned. The cities which can accommodate them are becoming increasingly costly locations as far as room and board are concerned. Because of the number of attendees and papers given, the meeting is spread out among a number of hotels (sometimes spread out over a whole city). This does not provide the type of atmosphere which maximizes the opportunity for individuals to get together for the types of interpersonal contacts and discussions which are most important. In addition, the high costs tend to discriminate against students and younger chemists who do not have funds available for attending the meetings. Also, many of these locations do not provide an attractive or desirable background in which to hold a meeting.

It is noted that, for the most part, the smaller meetings (those which are regional or divisional in character) are not held in those locations which are selected for National Meetings. Also, as previously noted, the attendance at the smaller meetings has been increasing steadily.

In the light of these problems, the ACS is considering plans to increase the role of smaller meetings in the future and to rely less on the National Meetings for informal information transfer. As this emphasis shifts, Regional, Divisional, and Multi-Divisional Meetings would become the forum for contributed papers in restricted fields of current high technical interest. At the National Meetings, greater emphasis would be placed on professional and public aspects of chemistry, with technical topics of broad interest, and interdisciplinary aspects of chemistry playing a greater role. Eventually a new balance between Regional, Divisional, and National Meetings might permit a reduction to one National Meeting each year.

Table VIII Appendix C illustrates a revised meeting structure toward which the ACS might work. This structure represents one of the several possible long-range goals for restructurin meetings. As the problem is carried out, it will be necessary to examine continually the types which are most useful to the scientist and to apply the findings to future changes in programming. The plan is framed tentatively to reflect the fact that the planning process in this area is new.

Assuming that this plan is viable, the Society would proceed as follows:

National Meetings-- The restructured meeting program envisions one National Meeting per year. This meeting will emphasize public and professional aspects of chemistry. The Board, Council, and various Board-Council Committees will meet at this time to conduct Society business. The program at the meeting will consist of symposiums in which recognized leaders in various fields of chemistry and related areas will be called upon to present review papers and state of the art discussions of fields currently high in interest. These will include the traditional fields of chemistry, technologically important areas, interdisciplinary fields, and areas where chemistry interfaces with problems of broad public concern. The meeting will provide a forum for discussing future employment patterns for chemists and future funding support for research and education in chemistry. In general, an attempt will be made to provide programs with high acceptance among chemists and a strong positive image to the public at large. To carry out the organization of such a program, central coordination will be necessary; such coordination is not now available, since most of the planning of the technical sessions for ACS National Meetings is currently done by the Divisions.

Plans will be developed to record selected material from the meeting and to make these recordings available for further use. In addition, other forms of dissemination such as television (possibly with closed-circuit presentations in other cities) will be investigated with the view of increasing the value of such meetings to the chemistry community.

Regional Meetings -- Although the contributed paper may generally no longer be effective at National Meetings, it is important to a broad segment of the chemistry community. For this reason, the ACS meeting structure will provide for this type of presentation. In the revised meeting structure, presentation of such papers will be centered in the Regional, Divisional and or Multi-Divisional Meetings. The Regional, Divisional or Multi-Divisional Meeting will take on much of the character of a National Meeting except that only a limited number of Divisions will participate in any given meeting. These meetings will follow the program patterns that are currently found at National Meetings, that is, special symposiums, Divisional symposiums, and contributed papers.

It is expected that the programming of these meetings will generally involve joint efforts of the Divisions and the Regions. However, some of the meetings would be the sole responsibility of Divisions or of Regions. In the long term it is expected that the Regions and Divisions will find it mutually desirable to join forces in the programming of meetings. Including Divisions in the programming for the Regional Meetings will give these meetings a Society-wide character, since the Divisional membership is national in scope. By providing for membership-wide programs, it will be possible to develop these meetings into "national meetings in miniature." This may come much closer to fulfilling the needs of individual chemists than is now possible with the large National Meetings. In addition, chemists in many areas of the country can be assured of being within commuting distance of such a meeting every year or so. Also, since these meetings will be smaller than

National Meetings, they can be held in facilities that encourage interpersonal contact among meeting attendees. Smaller meetings will also contribute to reduced administrative cost, since the smaller size will make possible the use of larger amounts of volunteer help and will permit scheduling in cities in which the personal expenses of attendees would be much lower than are now incurred at National Meetings. Finally, the smaller meetings will provide much opportunity for experimenting with new program formats and practices.

Division Symposiums -- The Divisional symposiums provide concentrated attention on subject specialties. These meetings are generally small and can be held in locations such as a university campus. The frequency and programming of these meetings will continue to be a matter of Divisional control. The nature of Divisional symposiums may also change as other aspects of the overall ACS program of meetings develops.

Conferences -- The frequency of small conferences of 100 to 150 participants has increased over the years to help in providing close interpersonal contact among scientists. The best-known of these programs is that of the Gordon Conferences managed by the American Association for the Advancement of Science. However, many others are held throughout the year, sponsored by such organizations as the Welch Foundation, many universities and laboratory groups such as Oak Ridge, and by other technical interest groups.

The ACS recognizes this type of meeting as an important aspect of a total program of meetings to serve the needs of chemists. Since no current ACS programs exist in this area, the ACS plans to work with Divisions and other groups in developing a broad ACS conference program.

The ACS plans to establish and operate conference centers around the United States. At first, the facilities will be leased or rented. As the program grows, some of them might become permanent centers managed by full-time ACS staff members. This would reduce costs by eliminating staff transportation and rental charges. In addition, the non-profit operation of the centers will keep cost to the attendees to a minimum. Such centers will also provide a location for ACS Short Courses and housing for regional ACS staff offices. Until the need for permanent centers is well established, ACS will make use of existing facilities which can be rented for a sufficient number of weeks during the year to fulfill the programming requirements.

Local Section Meetings -- ACS has just undertaken an evaluation of Local Section programs to suggest new directions for these programs. Specific proposals will be made concerning future Local Section meetings when this study is completed. However, Local Sections are expected to continue to sponsor so-called "meetings in miniature" which provide outlets for papers from local industry and educational institutions and which often involve student participation.

Studies, Evaluation, and Innovative Programs -- Studies by individuals such as Garvey at Johns Hopkins University, Griffith at the American Psychological Association, and Allen of Massachusetts Institute of Technology have indicated that the value that an individual gains from a meeting is not a simple function of his attendance at the technical sessions. In fact, his attendance at such sessions may be of secondary importance, for it appears that the greatest

value gained is through the informal contacts and discussions that take place outside the formal program. For this reason, it seems important to place great emphasis on those aspects of meetings which tend to foster contacts between individuals.

Little hard information is available which would quantitatively substantiate these conclusions. It is therefore necessary to begin to develop techniques for evaluating the effects of the proposed changes in meeting form, content, size, location and formats.

Evaluating new formats to substitute for or supplement the current presentation of papers will include experimentation with greater use of preprints, the use of preprints followed by brief comments by the author and a long discussion period, the use of preprints with the author available for discussion only, discussion leaders with no formal material presented or prepared prior to the meeting, and experimentation with audio-visual techniques to enhance group discussions. Furthermore, technology now provides a means of making available to individuals or groups not at the meeting, the audio or audio-visual recordings of particularly significant presentations or symposiums. This would provide a significant new dimension to the overall ACS communications programs.

At the Fall 1970 meeting the ACS Division of Chemical Literature will have an innovative, experimental symposium in which novel approaches to sound, projection,lighting and seating will be tried. Physically the speaker will be positioned in the center of his audience much like in a theater in the round. Attendance at this symposium will be limited, there will be two sessions, and the full audience at each session will be queried. See Chemical and

Engineering News, September 7, 1970, page 51.

At the same meeting about a dozen symposiums will be audio-taped for subsequent distribution. This experiment will not only yield valuable information concerning demand for or interest in augmented distribution of symposium presentation but is also defining fundamental questions about ownership of material presented at Society meetings.

SCHEDULE FOR RESTRUCTURING ACS MEETINGS

1970

1. Develop plans to restructure Fall National Meeting to emphasize public and professional aspects and broad-interest technical topics.

2. Develop plans for Divisional participation in Regional Meetings.

3. Develop an ACS Conference Program with plans for Division-sponsored conferences and rental of conference facilities.

4. Explore new and effective means for disseminating meeting results including closed-circuit television and audio-visual recordings. Experiment with symposium format and audio distribution.

1971

1. Continue development of #1 above. In conjunction with the Council Committees on National Meetings and Expositions and Divisional Activities plans would be developed to:

   a) Increase the scope of programs (symposia) covering topics of general public interest.

   b) Provide more symposia of wide interest to chemists with papers by leaders in the respective fields.

   c) Provide for the initiation of programs (symposia) through direct staff participation.

   d) Continue discussions on limiting contributed papers programs at national meetings.

2. Through the Divisional Activities Committee, Divisions would be encouraged to work with local sections in sponsoring programs at regional meetings through:

   a) Encouragement of the appointment of a regional meeting program chairman or including regional meetings in division program chairman activities.

   b) Establishment of a divisional-regional "clearing" house for future programs.

   c) Encouragement of joint divisional participation (5-6 divisions) in programs at regional meetings.

3. In conjunction with the Committees on National Meetings and Expositions, and Divisional Activities, plans to implement an ACS small conference program will be finalized. This should include the following:

a) Location of conference sites and the establishment of dates available.

b) Preparation of plans for services provided by staff--schedules for submitting programs, etc., procedures for scheduling meeting and cost per participant.

c) Organization of programs including the following:

1) Division symposia.

2) Short Courses.

3) Other special programs.

4. Initiate staff studies and experiment with the following:

a) Tape recorded symposia (made available to membership through the Education Office).

b) Audio-visual recording of talks and symposia to be used by organizations; i.e., colleges, industry, research institutions, etc.

c) Closed circuit TV to supplement meeting effectiveness.

d) Innovative meeting formats.

1972 1. Institute in Fall Meeting of 1972 programs a), b) and c) developed under Item #1 - 1971, through the coordination of programs by the Office of Divisional Activities and Informal Communications.

Continue development of plans to limit contributed papers at the Fall National Meeting coordinated through the National Meetings and Expositions and Divisional Activities Committees.

2. Initiate introduction of Division symposia and contributed paper (Item #2 - 1971) programs at regional meetings. Coordinate divisional efforts (through Divisional Activities Committee) to organize programs both separately and jointly.

3. Initiate small conference programs (Item #3 - 1971) in the Spring of 1972. Operation of conference will be handled by office of National Meetings and Expositions and program coordination will be the responsibility of the Office of Divisional Activities and Informal Communications.

4. Continue experimentation with programs outlined under Item #4 - 1971. Run pilot studies on #4-a), b) and c).

5. Begin consideration of need for establishing office of "Meeting Editor". Consider scope of responsibilities of office and function of an "Editorial Board".

6. Begin to develop meeting evaluation techniques. Measurements should be available to:

   a) Determine program effectiveness.

   b) Determine overall meeting quality (program, facilities, locations).

   c) Measure acceptance of meetings by membership.

   d) Gain insight into types of groups various meeting formats serve.

1973 Continue to expand efforts toward achieving items under 1972 - #1, 2, 3, 4 and 6.

Develop plans for establishing an office of "Meeting Editor" and "Editorial Board" (1972 - #5) if program as developed requires permanent staffing and increased central coordination.

Implement transfer of some Divisional Meetings from Spring Meeting to Regional-Divisional Meetings.

Establish a permanent conference center, if results of the pilot program justify one.

Begin to apply meeting evaluation techniques.

1974 Continue de-emphasis of Spring Meeting, with the shift of additional Divisional programs to Regional-Divisional Meetings, and the shortening in time of the Spring Meeting.

Continue development and application of meeting evaluation techniques.

1975 Adjust Fall Meeting program to reflect reaction to the 1972-74 meetings.

Rent additional Conference Center facilities at a site remote from the permanent ACS Conference Center.

AMERICAN CHEMICAL SOCIETY SECONDARY SERVICES

I. CHEMICAL ABSTRACTS (CA)

PRODUCT (1) Complete CA; CHABA8

COMPONENTS Issues: Abstracts, Keyword Subject Index, Numerical Patent Index, Patent Concordance, Author Index. Volume Indexes: Author Index, Subject Index, Numerical Patent Index, Patent Concordance, Molecular Formula Index, Hetero-Atom-in-Context (HAIC) Index, Index of Ring Systems(b), Index Guide(c).

USER ROUTES OF ACCESS Book Form.

PERIODICITY Weekly (half of subject matter covered each week). 2 Volumes/year.

CONTENT Complete coverage of published chemical and chemical engineering literature.

SOURCES 7,200 journals contribute each year; 13,000 different journals are monitored each year; 1,500,000 papers, patents, and reports are reviewed in the selection process; Abstracts of about 213,000 papers and 40,000 patents are covered; An additional 33,000 patents are covered through the Concordance.

METHODS OF PRODUCTION Approximately 2,900 Out-of-House Abstractors from all parts of the world; 45 Abstractors in-house; Traditional hot-metal publication system for abstract section of issues(e); Computer composition for all issue indexes and all volume patent indexes(f).

AT WHOM DIRECTED All scientists who have need of chemical and chemical engineering information. The jargon of the abstracts follows that of the original publication. The index language follows widely accepted practice with highly specialized jargon utilized only as cross reference access points. The extensive cross reference system of the subject index is designed to lead the trained scientist -- not necessarily a chemist or a chemical engineer -- to the appropriate points(s) in the index during the search process. The author, numerical patent, patent concordance, subject, formula, HAIC, and ring system indexes are designed to be used in combination. The volume subject indexes depend upon a carefully-managed, chemically-oriented arrangement of subject matter. The issue keyword subject indexes are not organized in the same way: these issue indexes include very few cross references, and their indexing vocabulary is only slightly controlled.

SUBSCRIPTION PRICES 1967 $1,200(d); 1968-69 $1,550(d); 1970-71 $1,950(d); 1972-73 $2,400(d); 1974-75 $2,850(d).

NUMBER OF SUBSCRIPTIONS(a) 1967 6653; 1968 6475; 1969 6442; 1970-71 6400; 1974-75 6200.

PRODUCT (2) CA Condensates

COMPONENTS Titles of Papers and Patents; Bibliographic Data; Author Names; Issue Keyword Subject Index.

USER ROUTES OF ACCESS Computer Search.

PERIODICITY Weekly. 2 Volumes/year.

CONTENT Same as Complete CA.

SOURCES Same as Complete CA.

METHODS OF PRODUCTION Computer System.

AT WHOM DIRECTED Same as Complete CA.

SUBSCRIPTION PRICES 1968-71 $4,000(h); 1972-75 $5,000(h).

NUMBER OF SUBSCRIPTIONS New in 1968; 1969 34(i); 1970 25(i); 1971 31(i); 1972 40(i); 1973 45(i); 1974 60(i); 1975 60(i).

PRODUCT (3) CA Groupings of Sections; Present Groupings: a. Applied Chemistry and Chemical Engineering (CAAEA2), b. Biochemistry (CABSBG), c. Macromolecular Chemistry (CAMLAF), d. Organic Chemistry (CAOCAW), e. Physical and Analytical Chemistry (CAPCB4).

COMPONENTS Abstracts; Keyword Subject Index -- entries are overruns of those appearing in the weekly issues of CA which include that Grouping of Sections.

USER ROUTES OF ACCESS Book Form.

PERIODICITY Biweekly. 2 Volumes/year.

CONTENT The Groupings collectively are equivalent to the Complete CA. No abstract appears in more than one Grouping. The Issue Indexes are overruns of the corresponding weekly issue index of CA.

SOURCES Collectively, the Grouping coverage is the same as the Complete CA.

METHODS OF PRODUCTION Same as Complete CA. (Groupings are printed by overrun of portions of the Complete CA and are bound separately.)

AT WHOM DIRECTED Same as Complete CA.

SUBSCRIPTION PRICES 1968-71 $70(j); 1972-75 $80(j).

NUMBER OF SUBSCRIPTIONS 1969 9,800(k); 1970-75 10,000(k).

PRODUCT (4) CA on microfilm with license to photocopy; CA abstracts for use internally within an organization(1).

COMPONENTS All abstracts published in CA 1907 to date are furnished on microfilm. File updates are made as material is accumulated.

USER ROUTES OF ACCESS Book Form. Indexes must be used in combination with microfilm reader or reader-printer.

PERIODICITY Available as the "whole" only.

CONTENT Complete CA, from 1907 to date.

SOURCES Same as Complete CA, from 1907 to date.

METHODS OF PRODUCTION Standard: 16 mm. microfilm, coded for retrieval on reader-printers, and loaded into cassettes to fit user's equipment(n).

AT WHOM DIRECTED See Complete CA; special suitability for information services of companies that prepare internal abstract bulletins.

SUBSCRIPTION PRICES 1968 first year $1,800(m) succeeding years $1,200; 1969-70 first year $2,000(m) succeeding years $1,350; 1971-72 first year $2,200(m) succeeding years $1,550; 1973-75 first year $2,400(m) succeeding years $1,750.

NUMBER OF SUBSCRIPTIONS End 1968 145; 1969 205; 1970 280; 1971 360; 1972 440; 1973 525; 1974 600; 1975 660.

PRODUCT (5)(A) License to copy individual CA abstracts (B) Current Abstracts (C) Noncurrent Abstracts

COMPONENTS (A) Abstracts only.

CONTENT (B) Current Calendar Year; Complete CA. (C) Same as Complete CA, 1907 to date.

SOURCES (A) Same as Complete CA.

AT WHOM DIRECTED (A) Same as Complete CA.

SUBSCRIPTION PRICES (A) NOT A SUBSCRIPTION ITEM (B) $750 plus $3 per 1,000 abstract impressions (C) $300 plus $2 per 1,000 abstract impressions.

NUMBER OF SUBSCRIPTIONS (A) NOT A SUBSCRIPTION ITEM.

PRODUCT (6) Ring Index; 16CAA5

COMPONENTS First CA Index citation for each molecular ring system. Drawings of molecular ring systems with assigned index numbering of rings. CA index names for the ring systems.

USER ROUTES OF ACCESS Name of Ring System; Index by Rings; Hetero-Element Index.

PERIODICITY Revised periodically.

CONTENT First cited reference in CA volume subject indexes to each cited ring system.

SOURCES CA Subject Indexes.

METHODS OF PRODUCTION Hand-drawn structures assembled manually; line-at-a-time card composition of text.

AT WHOM DIRECTED Users of Complete CA, CA collective indexes, and those who utilize CA indexing nomenclature. This index provides access to CA Subject indexes for those who are not able to derive index names.

SUBSCRIPTION PRICES NOT A SUBSCRIPTION ITEM 2nd Edition $35; Supplements I $15, II $15, III $15.

NUMBER OF SUBSCRIPTIONS NOT A SUBSCRIPTION ITEM

PRODUCT (7)(g) CA Basic Journal Abstracts; BJOABB

COMPONENTS Title; Bibliographic Data; Full Text of Abstract; (Printed copy of the full text of the computer language record is provided for use in conjunction with the results of computer searching of the corresponding magnetic tape version of each issue.)

USER ROUTES OF ACCESS Computer Search

PERIODICITY Biweekly. 1 Volume/year.

CONTENT Abstracts of papers of chemical and chemical engineering interest.

SOURCES 32 basic chemical journals and 3 supplements abstracted completely.

METHODS OF PRODUCTION Computer System.

AT WHOM DIRECTED Organizations requiring the selective dissemination of information.

SUBSCRIPTION PRICES 1968-71 $4,000(h); 1972-75 $5,000(h).

NUMBER OF SUBSCRIPTIONS New in 1968; 1969 34(i); 1970 25(i); 1971 31(i); 1972 40(i); 1973 45(i); 1974 60(i); 1975 60(i).

PRODUCT (8) CA Collective Indexes

COMPONENTS Eighth Collective: Author Index; Subject Index; Numerical Patent Index; Patent Concordance; Molecular Formula Index; Index of Ring Systems; Index Guide; Hetero-Atom-in-Context (HAIC) Index; Registry/Name/Molform Index.

USER ROUTES OF ACCESS Book Form. Computer Search.

PERIODICITY Currently 5 years per collective period.

CONTENT 10 volumes of volume indexes combined into a single set of indexes.

SOURCES Semi-annual CA Volume Indexes.

METHODS OF PRODUCTION Computer System.

AT WHOM DIRECTED Users of Complete CA.

SUBSCRIPTION PRICES NOT A SUBSCRIPTION ITEM $3,000(m).

NUMBER OF SUBSCRIPTIONS NOT A SUBSCRIPTION ITEM.

PRODUCT (9)(g) Patent Concordance on magnetic Tape

COMPONENTS CA Reference to first patent issued covering a given invention plus a listing of corresponding patent numbers issued in other countries.

USER ROUTES OF ACCESS Computer Search.

PERIODICITY Biweekly, updates.

CONTENT A correlative listing of identical patents issued by different countries with a CA reference to the abstract of the first patent received for abstracting. The correlations are determined by a manual search system.

SOURCES Patents issued by 26 countries.

METHODS OF PRODUCTION Computer System.

AT WHOM DIRECTED Users of Complete CA and users of the chemical and chemical engineering patent literature.

SUBSCRIPTION PRICES 1969-73 Base (Vols. 56-67) $2,400; Each succeeding volume $200; Annual Subscription (biweekly updates) $500.

NUMBER OF SUBSCRIPTIONS New in 1969; 1969 5; 1970-71 10; 1972 15; 1973 20.

PRODUCT (10)(g) CA on tape

COMPONENTS (A) Issues on tape: Abstracts; Keyword Subject Index; Numerical Patent Index; Patent Concordance; Author Index. (B) Volume Subject Indexes on tape: Subject Descriptors including names of compounds; CA References.

USER ROUTES OF ACCESS (A) Computer Search (B) Computer Search.

PERIODICITY (A) Biweekly for a complete issue. (B) 2 Volumes/year.

CONTENT (A) Same as Complete CA. (B) Same as CA Volume Subject Indexes.

SOURCES (A) Same as Complete CA. (B) Same as Complete CA.

METHODS OF PRODUCTION (A) Computer System. (B) Computer System.

AT WHOM DIRECTED (A) Same as Complete CA. (B) Same as Complete CA.

SUBSCRIPTION PRICES (A) 1972-73 $5,000; 1974-75 $5,500. (B) 1971-75 $6,000.

NUMBER OF SUBSCRIPTIONS (A) New in 1972; 1972 5; 1973 10; 1974-75 20. (B) New in 1971; 1971 5; 1972 10; 1973 20; 1974 40; 1975 60.

II. CHEMICAL TITLES (CT); CHTIAM

PRODUCT (1) Book Form

COMPONENTS Keyword-in-Context (KWIC) Index; Bibliography -- Table of Contents display including titles, authors, and bibliographic data; Author Index.

USER ROUTES OF ACCESS Book Form.

PERIODICITY Biweekly. 1 Volume/year.

CONTENT Citations of paper titles from selected, highly productive, mainly chemical and chemical engineering journals. Papers are selected individually for subject content, thus every journal is covered in CT.

SOURCES Approximately 700 selected journals.

METHODS OF PRODUCTION Computer System.

AT WHOM DIRECTED This is an alerting service which provides prompt indexed access to chemical information.

SUBSCRIPTION PRICES 1968-70 $60(o); 1971-72 $35(o); 1973-74 $45.

NUMBER OF SUBSCRIPTIONS End 1968 2,900; 1969 2,856; 1970 3,000; 1971 4,000; 1972-75 5,000.

PRODUCT (2)(g) Magnetic Tape and Search Services

COMPONENTS The data content from the entire corresponding Book Form Publication.

USER ROUTES OF ACCESS Computer Search.

PERIODICITY Biweekly.

CONTENT As above. (Book Form)

SOURCES As above. (Book Form)

METHODS OF PRODUCTION Computer System.

AT WHOM DIRECTED Organizations requiring the selective dissemination of information.

SUBSCRIPTION PRICES 1968 $1,500; 1969-70 $1,700; 1971-72 $1,800; 1973-75 $2,000.

NUMBER OF SUBSCRIPTIONS End 1968 35; 1969 29; 1970 30; 1971 35; 1972 40; 1973 45; 1974-75 50.

III. CHEMICAL-BIOLOGICAL ACTIVITIES (CBAC); CBACA3

PRODUCT (1) Book Form

COMPONENTS (A) Issues: Digests; Keyword-in-Context Index; Molecular Formula Index; Registry Number-Faceted Number Cross Reference Index; Faceted Number-Registry Number Cross Reference Index; Author Index. (B) Volume Indexes: Keyword-in-Context Index; Molecular Formula Index; Registry Number Index; Registry Number-Faceted Number Cross Reference Index; Faceted Number-Registry Number Cross Reference Index; Author Index.

USER ROUTES OF ACCESS (A) Book Form.

PERIODICITY (A) Biweekly. (B) 2 Volumes/year.

CONTENT (A) Abstracts of papers that report biological activity of chemicals.

SOURCES (A) Approximately 600 journals.

METHODS OF PRODUCTION (A) Computer System.

AT WHOM DIRECTED (A) All individuals and organizations dealing with biological testing and control of biologically active substances.

SUBSCRIPTION PRICES (A) 1968-71 $1,100; 1972-73 $1350; 1974-75 $1,500.

NUMBER OF SUBSCRIPTIONS (A) End 1968 225; 1969 216; 1970 210; 1971 215; 1972 230; 1973 250; 1974-75 275.

PRODUCT (2)(g) Magnetic Tape and Search Services

COMPONENTS The data content from the entire corresponding Book Form Publication.

USER ROUTES OF ACCESS Computer Search.

PERIODICITY Biweekly.

CONTENT As above. (Book Form)

SOURCES As above. (Book Form)

METHODS OF PRODUCTION Computer System.

AT WHOM DIRECTED Organizations requiring selective dissemination and retrospective search of the journal literature.

SUBSCRIPTION PRICES 1968 $500(p); 1969-70 $650(p); 1971-72 $900(p); 1973-75 $1,250(p).

NUMBER OF SUBSCRIPTIONS End 1968 20; 1969 22; 1970 30; 1971 35; 1972 40; 1973 45; 1974-75 50.

IV. POLYMER SCIENCE & TECHNOLOGY (POST)

PRODUCT (1) POST-J Book Form; POSTJD

COMPONENTS (A) Issues: Digests; Keyword Subject Index; Molecular Formula Index; Author Index. (B) Volume Indexes: Keyword Subject Index; Molecular Formula Index; Author Index; Registry Number Index.

USER ROUTES OF ACCESS (A) Book Form

PERIODICITY (A) Biweekly. (B) 2 Volumes/year.

CONTENT (A) Digests cover the full range of the science and technology of polymers. They are grouped under six subject sections: Synthetic Polymers, Plastics Technology, Textiles, Elastomers, Coatings, Cellulose and other Carbohydrates.

SOURCES (A) Approximately 500 selected journals are covered by express handling; abstracts from other journals covered by CA are also included.

METHODS OF PRODUCTION (A) Computer System

AT WHOM DIRECTED POST is intended to provide immediate information on new developments in science and technology for all groups working in polymer fields from basic research through applications technology.

SUBSCRIPTION PRICES 1968-71 $1,200(q); 1972-73 $1,500(q); 1974-75 $1,800(q).

NUMBER OF SUBSCRIPTIONS End 1968 120; 1969 122; 1970 130; 1971 135; 1972 170; 1973 200; 1974-75 230.

PRODUCT (2)(g) POST-J Magnetic Tape and search Services

COMPONENTS The data content from the entire corresponding Book Form publication.

USER ROUTES OF ACCESS Computer Search.

PERIODICITY Biweekly.

CONTENT Same as POST-J Book Form.

SOURCES Same as POST-J Book Form.

METHODS OF PRODUCTION Computer System.

AT WHOM DIRECTED Same as POST-J Book Form.

SUBSCRIPTION PRICES End 1968 13; 1969 11; 1970 15; 1971 15; 1972 20; 1974-75 25.

PRODUCT (3)POST-P Book Form; POSTPJ

COMPONENTS (A) Issues: Digests; Keyword Subject Index; Molecular Formula Index; Author Index; Numerical Patent Index; Patent Concordance. (B) Volume Indexes: Keyword Subject Index; Molecular Formula Index; Author Index; Registry Number Index; Numerical Patent Index; Patent Concordance.

USER ROUTES OF ACCESS Book Form.

PERIODICITY (A)Biweekly. (B) 2 Volumes/year.

CONTENT Digests cover the full range of the science and technology of polymers. They are grouped under six subject sections: Synthetic Polymers, Plastics Technology, Textiles, Elastomers, Coatings, Cellulose and other carbohydrates.

SOURCES Covers patents from 26 countries.

METHODS OF PRODUCTION Computer System.

AT WHOM DIRECTED Same as POST-J Book Form.

SUBSCRIPTION PRICES 1968-71 $1,000(q); 1972-73 $1,300(q); 1974-75 $1,600(q).

NUMBER OF SUBSCRIPTIONS End 1968 100; 1969 90; 1970 110; 1971 115; 1972 145; 1973 165; 1974-75 205.

PRODUCT (4)(g) POST-P Magnetic Tape and Search Services(s)

COMPONENTS The data content from the entire corresponding Book Form publication.

USER ROUTES OF ACCESS Computer Search.

PERIODICITY Biweekly.

CONTENT Same as POST-P Book Form.

SOURCES Same as POST-P Book Form.

METHODS OF PRODUCTION Computer System.

AT WHOM DIRECTED Same as POST-J Book Form.

SUBSCRIPTION PRICES 1968 $500; 1969-70 $650; 1971-72 $900; 1973-75 $1,250.

NUMBER OF SUBSCRIPTIONS End 1968 12; 1969 8; 1970 15; 1971 15; 1972-73 20; 1974-75 25.

V. PLASTICS INDUSTRY NOTES; PLINBI

PRODUCT Plastics Industry Notes; PLINBI

COMPONENTS Abstracts; Keyword Subject Index.

USER ROUTES OF ACCESS Book Form

PERIODICITY Weekly. 1 Volume/year.

CONTENT Abstracts are excerpts from business-oriented articles of interest to those concerned with polymer industry. Abstracts are classified into 11 subject sections.

SOURCES 30 selected publications.

METHODS OF PRODUCTION Computer System.

AT WHOM DIRECTED All individuals and organizations which manufacture or utilize polymeric materials. The information is business-oriented.

SUBSCRIPTION PRICES 1968-71 $225; 1972 $275; 1973-75 $325.

NUMBER OF SUBSCRIPTIONS 1969 85; 1970 90; 1971 90; 1972 125; 1973 150; 1974-75 175.

VI. CAS SOURCE INDEX

PRODUCT (1) CAS Source Index in Book Form

COMPONENTS Full Title; Abbreviated Title (USA Standards Institute Title abbreviations); Previous Title(s) (if any); ASTM CODEN plus CAS check character; Language(s) of Publication; History and Frequency of Publication; Publisher, Price,and Sales Agents; Title Cataloged according to American Library Association rules; Libraries Holding Documents and Extent of Collection; Patent Journals and Patent Specifications.

USER ROUTES OF ACCESS Book Form.

PERIODICITY 1969, 1977, then every 5 years.

CONTENT Reference tool designed to aid in the location of journals, patents, and congress and symposium proceedings that comprise the original literature of the chemical sciences of the past 140 years. Includes entries from previous CA List of Periodicals, Chemische Zentralblatt, and Beilsteins Handbuch der Organischen Chemie.

SOURCES CAS Library Files and survey of pertinent holdings of 297 libraries (235 U.S., 72 Foreign).

METHODS OF PRODUCTION Computer System.

AT WHOM DIRECTED All subscribers to CA, primary and secondary journal publishers, librarians, and information center personnel.

SUBSCRIPTION PRICES 1969-73 $1000; 1974-75 $1[illegible]0.

NUMBER OF SUBSCRIPTIONS 1969 2,500; 1970 1,500; 1971 1,000; 1972 800; 1973 200; 1974 200; 1975 200.

PRODUCT (2) CAS Source Index Quarterly in Book Form

COMPONENTS Same as CAS Source Index in Book Form.

USER ROUTES OF ACCESS Book Form.

PERIODICITY Quarterly, cumulated annually.

CONTENT All new bibliographic entries and changes with accompanying library holdings data from a selected list of libraries.

SOURCES CAS Library current cataloging and library holdings from about 300 libraries.

METHODS OF PRODUCTION Computer System.

AT WHOM DIRECTED All subscribers to CAS Source Index Book Form.

SUBSCRIPTION PRICES 1969-73 per year $75; 1974-75 $100.

NUMBER OF SUBSCRIPTIONS 1969 565; 1970 665; 1971 800; 1972-73 935; 1974 900; 1975 665.

PRODUCT (3)(g) CAS Source Index on Magnetic Tape

COMPONENTS The complete data content of the entire corresponding Book Form.

USER ROUTES OF ACCESS Computer Search.

PERIODICITY Duplicate of Data Base at time of purchase.

CONTENT Same as Book Form with additional search elements, e.g. Library of Congress Catalog Card Number.

SOURCES Same as Book Form.

METHODS OF PRODUCTION Computer System.

AT WHOM DIRECTED All subscribers to CA, primary and secondary journal publishers, librarians, and information center personnel.

SUBSCRIPTION PRICES 1969-73 $1,500; 1974-75 $2,000.

NUMBER OF SUBSCRIPTIONS 1969 5; 1970-75 10.

PRODUCT (4)(g) CAS Source Index Quarterly on Magnetic Tape

COMPONENTS The complete data content of the entire corresponding Book Form.

USER ROUTES OF ACCESS Computer Search.

PERIODICITY Quarterly.

CONTENT All additions, changes and deletions made to cumulative data base during previous quarter.

SOURCES Same as Book Form.

METHODS OF PRODUCTION Computer System.

AT WHOM DIRECTED All subscribers to CAS Source Index on Magnetic Tape.

SUBSCRIPTION PRICES 1969 per year $750.

NUMBER OF SUBSCRIPTIONS 1969 4; 1970-71 12; 1972-73 16.

FOOTNOTES

(a) Current figures are as of 31 Dec., 1969.

(b) Beginning in Volume 66, the Index of Ring Systems was included as part of the Formula Index; previously it was included with the Subject Index.

(c) Published only for odd-numbered volumes.

(d) $500 grant to Colleges and Universities who subscribe to CA.

(e) Selected sections are being produced by the computer system in a step-wise conversion of all composition by the computer system.

(f) Computer composition of Volume Indexes began with Volume 71 (July-December 1969).

(g) All CAS computer-readable services are to be leased, not sold.

(h) CA Condensates (Item 1.2) and Basic Journal Abstracts (Item 1.7) are also offered as a combination subscription; both for $5,000 in 1968-71; $6,000 in 1972-75.

(i) A combined subscription to CA Condensates and Basic Journal Abstracts is available for $1,000 more than the price of a single service. The projected number of subscriptions assumes all are combined subscriptions.

(j) Price is for each Grouping (annually including 26 issues); 50% discount for ACS members on one subscription to each Grouping. Quantity discounts 50-99 copies, 20% discount; 100 or more copies, 40% discount. Quantity discounts apply to combinations of Groupings.

(k) Subscription figures are total of all Groupings combined.

(l) Available only to current subscribers to Annual CA.

(m) For the 8th Collective Index to be sold starting in 1971, a prepayment, a prepublication discount is offered to all subscribers; no discount now available on Collective Indexes 1-7. Seventh Collective Index covering years 1962-66 to be completed in 1970; 8th Collective Index to begin publication in 1972.

(n) CAS reserves the right to charge for unusual packaging costs.

(o) Discount for ACS members on one copy. Quantity discounts: 20% on 50-99 copies; 40% on 100 or more copies.

(p) Sold only to subscribers to CBAC Book Form.

(q) POST-J and POST-P when taken as joint subscriptions are priced at $2100 in 1968-70. There will be no joint subscription price following 1970.

(r) Sold only to subscribers to POST-J Book Form.

(s) Sold only to subscribers to POST-P Book Form.

AMERICAN CHEMICAL SOCIETY PRIMARY SERVICES

PRODUCT Accounts of Chemical Research - ACHRE4

COMPONENTS Review journal. Issues - article: text. Volume Author and Subject Indexes: included in the last issue of each volume.

USER ROUTES OF ACCESS Book form. Microfilm

PERIODICITY Monthly. 1 volume/year.

CONTENT Short critical reviews concerned with all areas of chemistry. Articles deal in large part with research in the author's own laboratory. Recent developments are placed in perspective in relation to earlier work and their probable future significance.

SOURCES Most reviews are written by research workers of recognized accomplishment in response to invitations from the editor. On occasion, unsolicited manuscripts are published.

METHODS OF PRODUCTION Hot-type, Web offset.

AT WHOM DIRECTED General audience of research-minded chemists and scientists directly concerned with the subject of the article. In general, the initial pages of each article will be directed to the general audience, providing background and orientation as well as discussion of terms or concepts of special value in the field of the article. The rest of the paper discusses in greater detail and critically analyzes the subject reviewed.

SUBSCRIPTION PRICES Rates for one year: ACS Members - $5.00, Nonmembers - $10.00 Rates for single copies: Current issues - $1.50

NUMBER OF SUBSCRIPTIONS 14,600 - 1970; 12,500 - 1971

PRODUCT Advances in Chemistry Series - ADCSAJ

COMPONENTS Book. Individual articles that compose a set of interrelated papers on a given topic

USER ROUTES OF ACCESS Book Form

PERIODICITY Irregular (96 issues have been published from 1949 through 1969)

CONTENT Reviews and reports of current research in chemistry and allied fields.

SOURCES Original contributions comprising data collections and symposia on special topics in chemistry and allied fields.

METHODS OF PRODUCTION Offset, hot-type

AT WHOM DIRECTED All scientists interested in the particular chemistry-related topic.

SUBSCRIPTION PRICES Not a subscription item. Prices vary depending on the particular issue in question.

NUMBER OF SUBSCRIPTIONS Not a Subscription item. Estimated sales volume for 1970 - 20,000

PRODUCT ACS Meeting Preprints. Division of: 1) Fuel Chemistry, 2) Organic Coatings and Plastics Chemistry, 3) Petroleum Chemistry, 4) Polymer Chemistry, 5) Water, Air and Waste Chemistry

COMPONENTS Meeting papers, abstract, text.1) Contents page, 2) Table of Contents, 3) Table of Contents, 4) Author Index 5) Contents page.

USER ROUTES OF ACCESS Book Form

PERIODICITY 1 volume/year. Number of issues per volume is irregular

CONTENT General papers symposia.

SOURCES Original research from industry, educational institutions, research foundations, and government laboratories

METHODS OF PRODUCTION Photographed typewritten copy submitted by authors

AT WHOM DIRECTED Division members and meeting attendees, others interested in Division subject field.

SUBSCRIPTION PRICES Not subscription item. Prices varies with individual book. Usually $3.00 or $4.00.

NUMBER OF SUBSCRIPTIONS

PRODUCT ACS Monographs

COMPONENTS Book. Individual manuscripts that give a thorough treatment of a selected area of chemistry. Extensive references to the literature of subject area covered.

USER ROUTES OF ACCESS Book Form

PERIODICITY Irregular. 164 books have been issued from 1921-1968.

CONTENT Scientific and technologic monographs on chemical subjects

METHODS OF PRODUCTION Hot-type, offset

AT WHOM DIRECTED Chemists, chemical engineers, college students, management, and operational peronnel in industry

SUBSCRIPTION PRICES Not subscription item. Prices vary with individual book.

NUMBER OF SUBSCRIPTIONS

PRODUCT Analytical Chemistry - ANCHAM

COMPONENTS Journal including staff features. Regular issues - Technical Section--articles: text and abstract, notes: text, communications: text, aids for analytical chemists: text; Magazine Section--ACS Briefs: Highlights report for analytical chemists, book reviews; News Section--news briefs, calendar of events, scheduled technical courses; Future articles; Manufacturers' literature: New Products: New Chemical: Readers' Information service. April issue: special Review issue. July issue: special Laboratory Guide issue. Annual Author and Subject Indexes: Included in the last issue of each volume. Collective Indexes (author and subject indexes of technical articles)

USER ROUTES OF ACCESS Book Form, Microfilm.

PERIODICITY Monthly. 1 volume/year.

CONTENT Technical information covering all fields of analysis, both fundamental and applied. Report research, news, new products, new chemicals, and exchanges of comments between authors and readers.

SOURCES Content of the publication derives from two editorial areas: 1) original research contributions from industry, educational institutions, research foundations, and government laboratories, and 2) staff-written or originated articles.

METHODS OF PRODUCTION Hot-type, Web offset.

AT WHOM DIRECTED Analytical chemists and technicians in theoretical and applied fields, instrumentation specialists, and makers of analytical instruments and tools

SUBSCRIPTION PRICES Rates for ACS members: 1 year - $4.00, 2 years - $7.00, 3 years - $10.00. Rates for nonmembers: U.S. and Canada, 1 year - $5.00, 2 years - $9.00, 3 years - $12.00; Foreign except Canada, 1 year - $15.00, 2 years - $27.50, 3 years - $40.00. Rates for single copies: Current issues - $2.00 Rates for current Annual Review issues - $3.00. Latest Collective Index (Volumes 36-40, 1964-68) - $10.00

NUMBER OF SUBSCRIPTIONS 36,000 - 1970; 36,500 - 1971

PRODUCT Annual Reports in Medicinal Chemistry - ARMCBI

COMPONENTS Text. Author Index: List of Contributors. Subject Index. Compound Name Index.

USER ROUTES OF ACCESS Book Form

PERIODICITY Annual

CONTENT Brief, critical summaries of significant contributions to medicinal chemistry published during the past year and projections of future developments.

SOURCES Reviews are written by research workers in the field of medicinal chemistry upon the invitation of the editors.

METHODS OF PRODUCTION Photocomposition of typewritten copies submitted by authors. Offset.

AT WHOM DIRECTED All workers in the field of medicinal chemistry

SUBSCRIPTION PRICES Free to members of the Division of Medicinal Chemistry of the American Chemical Society. Subscription price varies from annual to annual

NUMBER OF SUBSCRIPTIONS 3,000-3,600

PRODUCT Audionews

COMPONENTS 15 minute news reports

USER ROUTES OF ACCESS Tape Cassette

PERIODICITY Weekly

CONTENT Latest news of the Chemical Industry

SOURCES ACS' global information network

METHODS OF PRODUCTION Reports on Magnetic Tape

AT WHOM DIRECTED Chemical Executives

SUBSCRIPTION PRICES $250 per year (free recorder. $75 for 3 month trial

NUMBER OF SUBSCRIPTIONS @ 160

PRODUCT Biochemistry - BICHAW

COMPONENTS Journal. Issues - articles: text and abstract; issue author index. Volume Author and Subject Indexes: included in the last issue of each volume.

USER ROUTES OF ACCESS Book form, Microfilm.

PERIODICITY Biweekly. 1 volume/year.

CONTENT Original research in all recognized or developing areas of fundamental biochemistry, with emphasis on the relationship between chemistry, biochemistry, and the other biological sciences. Subject matter includes enzymes, proteins, lipids, nucleic acids, metabolism, protein synthesis, and other expanding fields.

SOURCES Original research contributions from industry, educational institutions, research foundations, and government laboratories.

METHODS OF PRODUCTION Hot-type, Web offset

AT WHOM DIRECTED Biological Chemists, Molecular Biologists, and Chemical Biologists.

SUBSCRIPTION PRICES Rates for one year: ACS members - $20.00, Nonmembers - $40.00. Rates for single copies: Current issues - $2.00.

NUMBER OF SUBSCRIPTIONS 6,600 - 1970; 6,700 - 1971.

PRODUCT Chemical and Engineering News - CENEAR

COMPONENTS Official ACS Magazine.Regular Issues - Calendar of events, Chemical World developments, Industry, news, International news, Research news, ACS News, People, Feature article on topics of general interest. Special issues - Career Opportunities, Facts and Figures for the Chemical Process Industries: published in September. Discusses mid-term marketing conditions for various chemical product areas, examines the worldwide outlook for the chemical field in the year ahead, and presents detailed financial data on each of 130 leading chemical process firms. Quarterly indexes: subjects and names. Annual Cumulative Index.

USER ROUTES OF ACCESS Book form. Microfilm.

PERIODICITY Weekly. 1 volume/year.

CONTENT Official organ of the ACS. Informs readers of "chemical" events in all phases of chemistry for readers in industry, government, consulting, and education. Contents provide current facts and opinion, adding background as appropriate and interpreting the significance of those facts, opinions, and background. Contents also include official material of the Society and reports on widespread Society activities.

SOURCES Feature articles (not in every issue) are sought by the editor. Special Reports are staff-prepared. The general news contents are staff-compiled.

METHODS OF PRODUCTION Hot-type, Rotary, Letterpress (News portion: punched out on teletype-setter and transmitted. Run on electron machine) Few forms, Web offset.

AT WHOM DIRECTED Readers in industry, government, and education at all levels of experience. Those in industry comprise the bulk of readership.

SUBSCRIPTION PRICES All members of the ACS receive C&EN as part of their dues. Rates: U.S. & Canada, 1 year - $6.00, 2 years - $10.00, 3 years - 14.00. Foreign except Canada, 1 year - $14.00, 2 years - $27.00, 3 years $40.00. Rate for single copies: Current issues - $0.50. $20.00 for the complete Index service (Quarterly & Annual Cumulative Indexes) $15.00 for Annual index alone.

NUMBER OF SUBSCRIPTIONS 137,000

PRODUCT Chemical Reviews - CHREAY

COMPONENTS Review Journal. Issues - review articles: text. Volume Author and Subject Indexes: included in the last issue of each volume.

USER ROUTES OF ACCESS Book Form. Microfilm.

PERIODICITY Bimonthly. 1 volume/year.

CONTENT Authoritative, critical reviews and comprehensive summaries of recent research in theoretical chemistry. In general, topics have not been reviewed in readily available publications for the previous 5 years.

SOURCES Most of the reviews are sought by the editor and his board members from experts in the field.

METHODS OF PRODUCTION Hot-type, Letterpress, Web offset 1971.

AT WHOM DIRECTED Teachers and students in both undergraduate and graduate work, research chemists, and scientists in fields closely related to chemistry.

SUBSCRIPTION PRICES Rates for one year: ACS members - $5.00, Nonmembers - $7.00. Rate for single copies: Current issues - $5.00.

NUMBER OF SUBSCRIPTIONS 6,400 - 1970; 6,100 - 1971

PRODUCT Chemical Technology

COMPONENTS Magazine. Issues - Articles, Reports, Editorial - News Trends, Extracts of Patent and Non-Patent literature, Descriptions of Plant and Laboratory Operations. Annual Author and Subject Indexes

USER ROUTES OF ACCESS Book Form. Microfilm.

PERIODICITY Monthly. 1 volume/year.

CONTENT Original reports dealing with the relevance and economic application of chemistry and chemical engineering to products and processes of industry. Will include information that affects Technical Considerations in: Product Research and Development, Process Research and Development, Process Technology, Process Design, Plant Unit engineers and supervision, Plant Technical service, Licensing.

SOURCES Editor will solicit articles from selected authors and from programming mechanisms of various ACS Divisions.Unsolicited articles will be considered.

METHODS OF PRODUCTION Hot-type, Web offset.

AT WHOM DIRECTED A broad group of industrially oriented, chemically trained professionals specifically concerned with chemical technology.

SUBSCRIPTION PRICES Rates for one year: ACS member - $9.00, Nonmembers - $18.00.

NUMBER OF SUBSCRIPTIONS 15,000 - 1971 (free for 6 months)

PRODUCT Chemistry - CHRYAQ

COMPONENTS Magazine. Issues - feature articles: text, Research Reporter, Lab Bench, Walrus, Library at Large, Reader's Forum. C9mbined Author and Subject Annual Index.

USER ROUTES OF ACCESS Book Form. Microfilm.

PERIODICITY Monthly, except for a combined July/August issue. 1 volume/year.

CONTENT Interprets basic chemical concepts and relates new developments in terms the beginning student can understand. It is imaginatively illustrated throughout. Occasionally, feature articles on special topics prepared by outstanding men in science are published.

SOURCES Feature articles are prepared by outstanding men in science. Other issue contents are staff prepared or compiled.

METHODS OF PRODUCTION Hot-type, Web offset.

AT WHOM DIRECTED Students in the upper 40 percent of high school chemistry classes, college-level students interested in modern science, and chemistry teachers.

SUBSCRIPTION PRICES Rates for single subscriptions for one year - $4.00. One year rates for ten or more subscriptions entered with a single remittance - $3.00 each. Rate for single copies: Current issues - $1.00.

NUMBER OF SUBSCRIPTIONS 30,000 - 1971; 30,000 - 1971.

PRODUCT Environmental Science and Technology - ESTHAG.

COMPONENTS Journal, including staff features: Issues - Research Section, feature articles: text and abstract, news section--current developments outlook meeting guide, booklist, new products digest, new literature digest, professional consulting services directory. Volume Name and Subject Indexes: included in the last issue of each volume. Annual Guide.

USER ROUTES OF ACCESS Book Form. Microfilm.

PERIODICITY Monthly. 1 volume/year.

CONTENT The papers, reviews, news and commentaries present new knowledge and promote scientific inquiry in 1) the chemical nature of the environment, 2) environmental changes through pollution or other modifications, 3) beneficial technological control of the environment, and 4) the chemical nature and behavior of water, air, and waste as they are involved in man's urban, industrial and agricultural activities.

SOURCES Feature articles are direct reports of research contributions from industry, educational institutions, research foundations, and government laboratories. The remaining portion of material is staff-prepared or compiled.

METHODS OF PRODUCTION Hot-type, Letterpress.

AT WHOM DIRECTED Designed primarily for scientists and engineers concerned with studying, maintaining, or enhancing the quality of the natural environment through use of chemical principles.

SUBSCRIPTION PRICES Rates for one year: ACS member - $5.00, Nonmembers - $7.00. Rate for single copies: Current issues - $1.50.

NUMBER OF SUBSCRIPTIONS 30,000 - 1970; 36,000 - 1971

PRODUCT Industrial and Engineering Chemistry - IECHAD (Publication will cease at the end of 1970)

COMPONENTS Magazine. Issues - feature articles: text, annual reviews: text, news section: development trends, summaries of papers published in associated I&EC and its associated quarterlies. Volume Author and Subject Indexes: included in the last issue of each volume.

USER ROUTES OF ACCESS Book Form, Microfilm.

PERIODICITY Monthly. 1 volume/year.

CONTENT Surveys, reviews, state-of-the-art articles, and critiques of current technology in applied chemistry and chemical engineering, Original research contributions are published if they are of broad enough interest. Reports on current developments, new products, and new books are staff-prepared.

SOURCES Articles, reviews,and summaries are submitted by scientists in applied industrial research. News notes are staff-prepared.

METHODS OF PRODUCTION Hot-type, offset.

AT WHOM DIRECTED Chemists and chemical engineering in industry.

SUBSCRIPTION PRICES Rates for one year: ACS members - $4.00, Nonmember - $8.00. Rate for single copies: Current issues - $1.50.

NUMBER OF SUBSCRIPTIONS 17,500 - 1970

PRODUCT I&EC Fundamentals - IECFA7

COMPONENTS Journal. Issues - articles: text and abstract, communications: text and abstract,experimental techniques: text. Volume Author and Subject Indexes: included in the last issue of each volume.

USER ROUTES OF ACCESS Book Form. Microfilm.

PERIODICITY Quarterly.1 volume/year.

CONTENT Papers in the broad field of chemical engineering reserach, subject may be experimental, theoretical, descriptive, chemical, or physical.

SOURCES Original reports on chemical engineering investigations in industry, educational institutions, research foundations, and government laboratories.

METHODS OF PRODUCTION Hot-type, Web offset.

AT WHOM DIRECTED Chemical engineers engaged in basic research.

SUBSCRIPTION PRICES Rates for one year: ACS members - $5.00, Nonmembers - $10.00. Rate for single copies: Current issues - $3.50.

NUMBER OF SUBSCRIPTIONS 9,200 - 1970; 8,000 - 1971

PRODUCT I&EC Process Design and Development - IEPDAW

COMPONENTS Journal, Issues - article; text and abstract. Volume Author and Subject Indexes: included in the last issue of each volume.

USER ROUTES OF ACCESS Book Form. Microfilm.

PERIODICITY Quarterly. 1 volume/year.

CONTENT Reports on design methods, concepts, and their applications to process development of and process equipment. Includes empirical or semitheoretical data correlations design parameters, determinations, and methods of integrating systems analysis and process control into process design and development.

SOURCES Original research reports from industry, educational institutions, research foundations, and government laboratories.

METHODS OF PRODUCTION Photo-composed on the Photon Photographic-type composing machine using computer-generated tape. Web offset.

AT WHOM DIRECTED Designed to serve the chemical engineers engaged in process design and development.

SUBSCRIPTION PRICES Rates for one year: ACS members - $5.00; Nonmembers - $10.00. Rate for single copies: Current issues - $3.50.

NUMBER OF SUBSCRIPTIONS 9,100 - 1970; 8,000 - 1971.

PRODUCT I&EC Product Research and Development - IEPRA6

COMPONENTS Journal. Issues - articles: text and abstract. Volume Author and Subject Indexes: included in the last issue of each volume.

PERIODICITY Quarterly. 1 volume/year.

CONTENT Papers reporting findings on the preparation of new or improved chemical products improved methods for the preparation of existing products, properties and end uses of industrial products, new uses for existing products, and the modification of materials to satisfy the requirements of specific end uses.

SOURCES Original research contributions from industry, educational institutions, research foundations, and government laboratories.

METHODS OF PRODUCTION Photo-composed on the Photon Photographic-type composing machine using computer-generated tape. Web Offset.

AT WHOM DIRECTED Chemical engineers engaged in the preparation and improvement of chemical products.

SUBSCRIPTION PRICES Rates for one year: ACS members - $5.00; Nonmembers - $10.00. Rate for single copies: Current issues - $3.50.

NUMBER OF SUBSCRIPTIONS 9,300 - 1970; 8,300 - 1971

PRODUCT Information Science Abstract (Formerly Documentation Abstracts) - ISABBG.

COMPONENTS Abstract Issues - Abstracts, Issue Author Index, Issue Anonymous Title Index, Continuity Data appears with the "last" abstract of the series. Volume Author Index. Volume Anonymous Titles Index. Volume Subject Index. Volume Continuity Index appear in the last issue of each volume.

USER ROUTES OF ACCESS Book Form

PERIODICITY Quarterly. 1 volume/year.

CONTENT Information regarding important publications in information science and documentation and in related fields. The volume Continuity Index indexes, in numerical order, all abstracts, regardless of the year of publication, which were cited in cross-reference continuity data during the year and provides the numbers of the abstracts in which the citations occurred. A compact code symbol is used to designate the continuity relationship in each citation.

SOURCES Books, journals, conference proceedings, reports, and patents. Usually only current material are abstracted. A small number of core journals reports, and conference series are abstracted completely. Approximately one hundred additional journals are scanned regularly and abstracted selectively. Publishers' announcements are scanned for pertinent new books; announcements of accessions of government depositories are scanned for pertinent report literature.

METHODS OF PRODUCTION Photocomposition. Offset.

AT WHOM DIRECTED Workers in information science and documentation, special librarians in general, educators, equipment developers, information system planners, computer specialists, market researchers, and persons engaged in publishing translation, and technical writing.

SUBSCRIPTION PRICES $30 per year. $15.00 per year for members of sponsoring organizations. The publication is owned by a non-profit organization and produced under the sponsorship of: American Society for Information Science, Division of Chemical Literature of the American Chemical Society, and Special Libraries Association.

NUMBER OF SUBSCRIPTIONS 1,400.

PRODUCT Inorganic Chemistry - INOCAJ

COMPONENTS Journal. Issues - articles: text and abstract, notes: text, Correspondence: text, Issue author index. Volume Author and Subject Indexes: included in the last issue of each volume.

USER ROUTES OF ACCESS Book Form. Microfilm.

PERIODICITY Monthly. 1 volume /year.

CONTENT Articles range in content from the borders of organic chemistry to theoretical physics that are related in general terms to active research areas of inorganic chemistry.

SOURCES Original research reports from industry, educational institutions, research foundations, and government laboratories.

METHODS OF PRODUCTION Hot-type, Letterpress, Web Offset in 1971

AT WHOM DIRECTED Chemists involved in research on structure, properties, and reactions of inorganic compounds.

SUBSCRIPTION PRICES Rates for one year: ACS member - $14.00; Nonmembers - $28.00. Rate for single copies: Current issues - $3.50.

NUMBER OF SUBSCRIPTIONS 5,700 - 1970; 5,700 - 1971.

PRODUCT Journal of Agricultural and Food Chemistry - JAFCAU.

COMPONENTS Journal. Issues - articles: text and abstract, communications: text and abstract. Volume author and Subject Indexes: included in the last issue of each volume

USER ROUTES OF ACCESS Book Form. Microfilm.

PERIODICITY Bimonthly. 1 volume/year.

CONTENT Results of research in the fields of agricultural and food processing chemistry which is involved in the growing of human food, farm feeds, and fiber crops, and in the processing and industrial utilization of harvested crops. Topics include pesticides, fertilizers, plant growth regulators and the chemistry of food processing, including flavor research.

SOURCES Original research reports from industry, educational institutions, research foundations, and government laboratories.

METHODS OF PRODUCTION Hot-type, Letterpress, Web Offset in 1971

AT WHOM DIRECTED Chemists and chemical engineers involved in food and food processing research.

SUBSCRIPTION PRICES Rates for one year: ACS members - $10.00; Nonmembers - $20.00. Rate for single copies: Current issues - $5.00

NUMBER OF SUBSCRIPTIONS 4,800 - 1970; 4,900 - 1971

PRODUCT Journal of the American Chemical Society - JACSAT.

COMPONENTS Journal. Issues - articles: text and abstract, Communications: text, Book reviews. Volume Author and Subject Indexes: included in the last issue of each volume

USER ROUTES OF ACCESS Book Form. Microfilm

PERIODICITY Biweekly. 1 volume/year.

CONTENT Basic work in organic, physical inorganic, and biological chemistry that cut across more than one field or provide material in a specilized area of fundamental interest to everyone engaged in basic chemistry research.

SOURCES Original research contributions from industry, educational institutions, research foundations, and government laboratories.

METHODS OF PRODUCTION Hot-type, Web Offset.

AT WHOM DIRECTED Chemists involved in general basic chemistry research.

SUBSCRIPTION PRICES Rates for one year: ACS members $22.00; Nonmembers - $44.00. Rate for single copies: Current issues - $2.00.

NUMBER OF SUBSCRIPTIONS 18,200 - 1970; 18,500 - 1971.

PRODUCT Journal of Chemical Documentation - JCHDAN

COMPONENTS Journal, Issues - articles: text and abstract, news and announcement, book reviews. Volume Author and Subject Indexes: included in the last issue of each volume, the Volume Subject Index for Volume 9 was experimentally prepared in Double-KWIC format.

USER ROUTES OF ACCESS Book Form. Microfilm.

PERIODICITY Quarterly. 1 volume/year.

CONTENT Art and science of information documentation in chemistry, including information sources, services, storage, research and retrieval systems, data correlations systems, indexing and classification systems, notation systems, nomenclature, literature analyses, computer processing of information, technical writing, linguistics related to translating problems, educations and training of information scientists.

SOURCES Articles are written by chemists and information scientists from industry, universities, government agencies, and the Chemical Abstracts Service. News announcements and book reviews are staff-compiled.

METHODS OF PRODUCTION Photo-composed on the Photon Photographic-type Composing machine using computer-generated tape. Sheet-fed. Offset, Photon.

AT WHOM DIRECTED Research chemists and engineers, information and literature scientists, librarians, publishers, systems developers, computer scientists, as well as technical information groups and centers.

SUBSCRIPTION PRICES Rates for one year: ACS member - $7.00; Nonmembers - $14.00.

NUMBER OF SUBSCRIPTIONS 2,000 - 1970; 2,100 - 1971.

PRODUCT Journal of Chemical Education - JCEDAB.

COMPONENTS Journal. Issues - feature articles: text, articles: text, notes: text, resource papers: text, Report of the New England Association of Chemistry Teachers, Proceedings of the California Associations of Chemistry Teachers, book reviews. Volume Author and Subject Indexes: included in the last issue of each volume

USER ROUTES OF ACCESS Book Form

PERIODICITY Monthly. 1 volume/year.

CONTENT Articles and special symposia on the latest developments in the theory and practice of chemical education. Test demonstrations, safety procedures, basic laboratory experiment and techniques etc. are presented.

SOURCES Published by the ACS Division of Chemical Education. Feature articles are prepared by feature editors. Articles and notes are original contributions from investigators and teachers. Resource papers by investigators in the field of the subject at the request of the editor.

METHODS OF PRODUCTION Hot-type, Offset.

AT WHOM DIRECTED Teachers and students of chemistry at all education levels as well as practicing chemists interested in current methods and trends in chemical education.

SUBSCRIPTION PRICES Rates for one year: $4.00, Rate for single copies: Current issues - $0.60.

NUMBER OF SUBSCRIPTIONS 27,400

PRODUCT Journal of Chemical and Engineering Data - JCEAAX.

COMPONENTS Journal. Issues - articles: text and abstract. Volume Author and Subject Indexes: included in the last issue of every volume.

USER ROUTES OF ACCESS Book form. Microfilm

PERIODICITY Quarterly. 1 volume/year.

CONTENT Experimental or derived data relating to pure compounds of mixtures covering a range of states, manuscripts base on reorganization of published experimental data which aid in the identification or utilization of new organic or inorganic compounds, papers relating primarily to newly developed or novel synthesis of compounds.

SOURCES Contributions from industry, educational institutions, research foundations, and government laboratories.

METHODS OF PRODUCTION Photo-composed on the Photon Photographic-Type Composing machine using computer-generated tape. Web,Offset.

AT WHOM DIRECTED All scientists who use chemical and chemical engineering data.

SUBSCRIPTION PRICES Rates for one year: ACS member - $15.00; Nonmembers - $30.00. Rate for single copies: Current issues - $9.00.

NUMBER OF SUBSCRIPTIONS 2,500 - 1970; 2,500 - 1971.

PRODUCT Journal of Medicinal Chemistry - JMCMAR.

COMPONENTS Journal. Issues - articles: text and abstract, notes: text, new compounds, book reviews, issue author index. Volume Author and Subject Indexes: included in the last issue of each volume.

USER ROUTES OF ACCESS Book Form. Microfilm

PERIODICITY Bimonthly. 1 volume/year.

CONTENT Structural elucidation, chemistry, preparation, and physical properties of biologically significant materials, their structure-activity relationship, transport and metabolism of drugs, and mechanisms of action of medicinal agents.

SOURCES Original research contributions from industry, educational institutions, research foundations, and government laboratories.

METHODS OF PRODUCTION Hot-type, Letterpress, Web offset (early '71)

AT WHOM DIRECTED Scientists interested in the structure-activity relations of biologically reactive chemicals.

SUBSCRIPTION PRICES Rates for one year: ACS members - $10.00; Nonmembers - $20.00. Rate for single copies: Current issues - $5.00.

NUMBER OF SUBSCRIPTIONS 3,900 - 1970; 3,800 - 1971

PRODUCT Journal of Organic Chemistry - JOCEAH.

COMPONENTS Journal. Issues - articles: text and abstract, notes: text, issue author index. Volume Author and Subject Indexes: included in the last issue of each volume.

USER ROUTES OF ACCESS Book form. Microfilm

PERIODICITY Monthly. 1 volume/year.

CONTENT General organic chemistry research that are comprehensive and critical accounts of original work in a given field. Areas emphasized are the facets of organic reactions, natural products, studies of mechanism, theoretical organic chemistry, and the various aspects of spectroscopy related to organic chemistry.

SOURCES Original research reports from industry, educational institutions, research foundations, and government laboratories.

METHODS OF PRODUCTION Hot-type, Web, Offset.

AT WHOM DIRECTED Chemists involved in theoretical, experimental, and applied organic chemistry research.

SUBSCRIPTION PRICES Rates for one year: ACS members - $16.00; Nonmembers - $32.00. Rate for single copies: Current issues - $4.00.

NUMBER OF SUBSCRIPTIONS 10,300 - 1970; 10,000 - 1971

PRODUCT Journal of Physical Chemistry - JPCHAX

COMPONENTS Journal, Issues - articles: text and abstract, notes: text, communications: text, issue author index. Volume Author and Subject Indexes: included in the last issue of each volume

USER ROUTES OF ACCESS Book Form, Microfilm

PERIODICITY Biweekly. 1 volume/year.

CONTENT Papers dealing with fundamental concepts, atomic and molecular phenomena, systems for which clearly defined models are applicable, as well as the newer aspects of physical chemistry, such as magnetic resonance spectroscopy, molecular electronic spectroscopy, and solid state phenomena.

SOURCES Original research reports from industry, educational institutions, research foundations, and government laboratories.

METHODS OF PRODUCTION Hot-type, Web, Offset.

AT WHOM DIRECTED Chemists and chemical engineers involved in basic physical chemistry research.

SUBSCRIPTION PRICES Rates for one year: ACS members $20.00; Nonmembers - $40.00. Rate for single copies: Current issues - $5.00.

NUMBER OF SUBSCRIPTIONS 6,300 - 1970; 6,300- 1971

PRODUCT Macromolecules - MAMOBX

COMPONENTS Journal. Issues, articles: text and abstract, review: text and abstract, notes: text, communications: text, issue author index, news section. Volume Author and Subject Indexes: included in the last issue of each volume.

USER ROUTES OF ACCESS Book Form. Microfilm.

PERIODICITY Bimonthly. 1 volume/year.

CONTENT Original research on all fundamental aspects of polymer chemistry, including synthesis, polymerization mechanisms and kinetics, chemical reactions, solution characteristics, and bulk properties or organic, inorganic and biopolymers. Announcements of pertinent polymer news are also included.

SOURCES Articles, reviews, notes, and communications are research contributions from industry, educational institutions, research foundations, and government laboratories. News material are staff-compiled.

METHODS OF PRODUCTION Hot-type, Letterpress, Web offset (early '71)

AT WHOM DIRECTED Chemists and chemical engineers involved in the theoretical, experimental, or applied research.

SUBSCRIPTION PRICES Rates for one year: ACS members - $12.00; Nonmembers - $24.00. Rate for single copies: Current issues: $6.00

NUMBER OF SUBSCRIPTIONS 2,600 - 1970; 2,800 - 1971

PRODUCT Rubber Chemistry and Technology - RCTEA4

COMPONENTS Journal. Issues. General Section Divisional activities, book reviews, calendar of meetings and conferences. Papers Section Articles: text

USER ROUTES OF ACCESS Book Form.

PERIODICITY 5 issues/year. 1 volume/year.

CONTENT Fundamental research, technical developments, and chemical engineering related to rubber and allied substances.

SOURCES Published by the ACS Division of Rubber Chemistry, Inc. General section contains staff-prepared material: Papers Section contains original contributions from investigators in the field.

METHODS OF PRODUCTION Hot-type, Letterpress.

AT WHOM DIRECTED Chemists and chemical engineers working in rubber chemistry and allied fields.

SUBSCRIPTIONS PRICES Rates for one year: Members and affiliates of the ACS Division Rubber Chemistry, Inc. - free. Nonmembers of the Division - $14.50

NUMBER OF SUBSCRIPTIONS 5,400

PRODUCT Abstracts of Papers (for ACS national meetings)

COMPONENTS Abstracts of meeting papers. KWIC Index of paper titles. Author Index, Index of Presiding Officers.

USER ROUTES OF ACCESS Book form.

PERIODICITY One booklet for each ACS national meeting.

CONTENT Abstracts of papers presented at each national meeting. Subjects cover the full range of areas of interest to chemists and chemical engineers. Each symposium is sponsored by one or more ACS divisions.

SOURCES Original reports of investigations, contributed by professionals in industry, educational institutions, research foundations, and government laboratories.

METHODS OF PRODUCTION Abstracts produced by photographing typewritten copy submitted by authors. KWIC Index, Author Index, and Index of Presiding Officers are computer-organized. Offset.

AT WHOM DIRECTED All chemists and chemical engineers desiring alerting service of reports to be presented at ACS National Meeting.

SUBSCRIPTION PRICES $4.00 per booklet. $3.00 per booklet to members of ACS Divisions.

NUMBER OF SUBSCRIPTIONS Not a Subscription item. Print run based on estimated attendance at a given meeting. Undistributed copies sold as back issues while supply remains. Estimated distribution volume for 1970: 15,500. 159th meeting, Houston - 4,500; Toronto - 5,000. 160th meeting, Chicago -6,000.

PRODUCT National Meeting Program Booklet

COMPONENTS Schedule of Events for each National Meeting. Lists of Divisional Programs. Lists of Papers to be Presented. Directory of Exhibitors. Author Index, Index of Presiding Officers. Map of Meeting City.

USER ROUTES OF ACCESS Book Form.

PERIODICITY One booklet for each ACS national meeting.

CONTENT Program of events and persons participating in National Meeting.

SOURCES Program chairmen and contributors to symposia and exposition.

METHODS OF PRODUCTION Typeset copy. Author Index is arranged by computer and printed conventionally.

AT WHOM DIRECTED Attendees at ACS National Meeting

SUBSCRIPTION PRICES Distributed to Meeting Attendees as part of Registration "package"

NUMBER OF SUBSCRIPTIONS Not a Subscription item. Print run corresponds to estimated Meeting Attendance.

PRODUCT Research Results Service

COMPONENTS Briefs of articles submitted for I&EC Quarterlies. Number of pages, tables, and figures given and price quoted.

USER ROUTES OF ACCESS Book Form.

PERIODICITY Monthly

CONTENT Short author-prepared statements summarizing papers submitted for publication

SOURCES Author-prepared, submitted with original manuscript.

METHODS OF PRODUCTION Hot-type offset.

AT WHOM DIRECTED Chemists and chemical engineers in industry and research.

SUBSCRIPTION PRICES Feature of I&EC. Monthly. Manuscripts cost: $2.00/10 pages - Subscriber; $4.00/10 pages - Nonsubscriber

NUMBER OF SUBSCRIPTIONS Not a subscription item. (1969) 2,043 sold @ $10,479.60 (1970, 1st Quar.) 523 sold @ $2,801.45

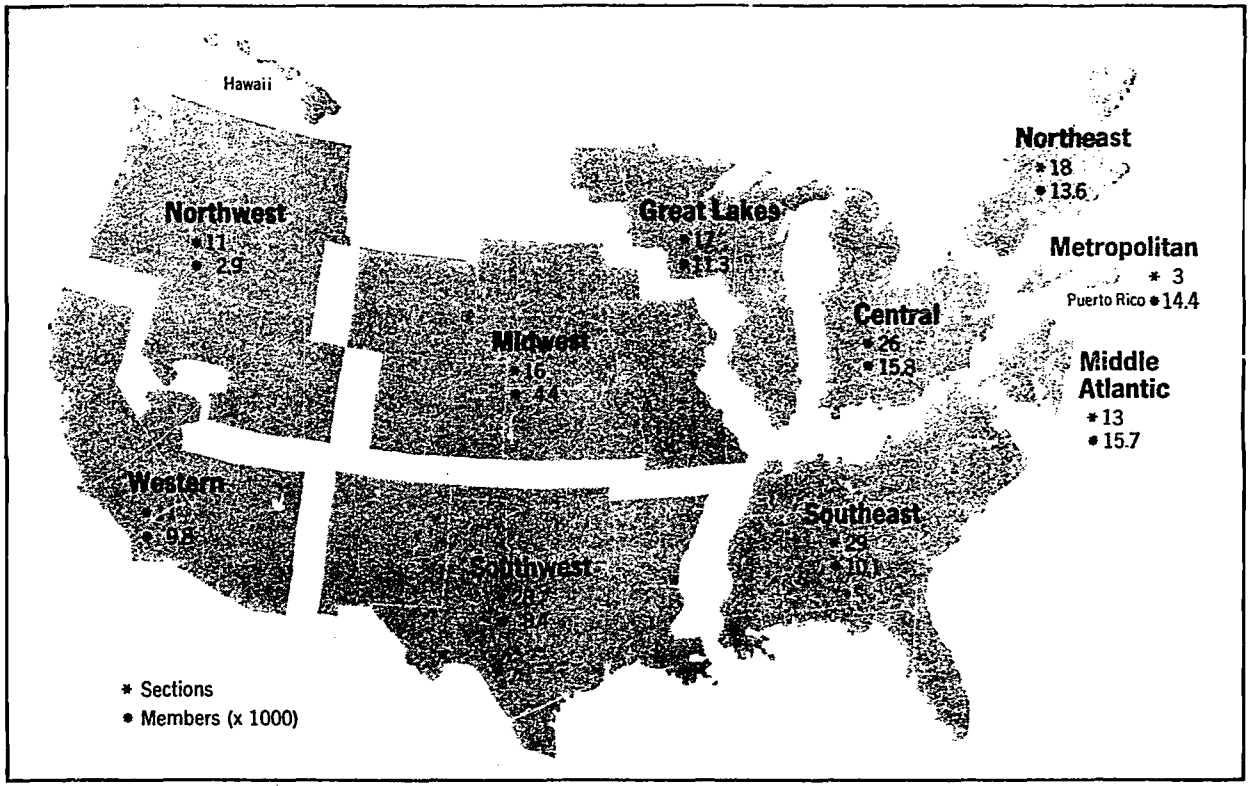
Hawaii
Northwest
• 11
• 2.9
Great Lakes
• 17
• 11.3
Northeast
• 18
• 13.6
Metropolitan
• 3
Puerto Rico • 14.4
Central
• 26
• 15.8
Middle Atlantic
• 13
• 15.7
Midwest
• 16
• 4.4
Western
• 98
Southeast
• 25
• 10.1
Southwest
* Sections
• Members (x 1000)

Figure 1

TABLE I

ACS NATIONAL MEETINGS

	Date	Location	Registration	Papers	Number of Divisions	Number of Sessions	Number of Authors
	1960						
137th	Apr.5-14	Cleveland, Ohio	7,012	1,222	20	165	2,015
		Half-day session tickets	972				
138th	Sept.11-16	New York, New York	13,300	1,761	22	246	3,052
		Half-day session tickets	1,167				
	1961						
139th	Mar.21-30	St. Louis, Missouri	5,888	1,084	20	167	2,229
		Half-day session tickets	390				
140th	Sept.3-8	Chicago, Illinois	9,818	1,594	23	236	2,894
		Half-day session tickets	672				
	1962						
141st	Mar.20-29	Washington, D.C.	8,491	1,159	20	173	1,965
		Half-day session tickets	971				
142nd	Sept.9-14	Atlantic City, New Jersey	8,255	*1,299	22	202	2,487
		Half-day session tickets	1,558				
	1963						
143rd	Jan.13-18	Cincinnati, Ohio	1,174	176	5	32	331
		Half-day session tickets	131				
144th	Mar.31-Apr.5	Los Angeles, California	5,344	1,088	18	177	2,909
		Half-day session tickets	668				
145th	Sept.8-13	New York, New York	12,909	1,655	23	258	3,352
		Half-day session tickets	3,564				
	1964						
146th	Jan.19-24	Denver, Colorado	1,304	314	4	42	655
		Half-day session tickets	143				
		(Advance Registration)	(286)				
147th	Apr.5-10	Philadelphia, Pennsylvania	6,727	814	19	146	1,627
		Half-day session tickets	1,634				
		(Advance Registration)	(1,256)				

*Nu[illegible]cing [illegible] Int[illegible]uct[illegible] Rem[illegible] Di[illegible]tin[illegible]

TABLE I (continued)

	Date	Location	Registration	Papers	Number of Divisions	Number of Sessions	Number of Authors
148th	Aug.30-Sept.4	Chicago, Illinois	10,306	1,564	25	246	3,218
		Half-day session tickets	928				
		(Advance Registration)	(2,279)				
	1965						
149th	Apr.4-9	Detroit, Michigan	7,175	1,102	20	187	2,185
		Half-day session tickets	509				
		(Advance Registration)	(2,037)				
150th	Sept.12-17	Atlantic City, New Jersey	10,324	1,682	24	262	3,354
		Half-day session tickets	1,046				
		(Advance Registration)	(3,295)				
	1966						
---	Jan.16-21	Phoenix, Arizona	1,328	289	5	53	569
		Half-day session tickets	44				
		(Advance Registration)	(489)				
151st	Mar.22-31	Pittsburgh, Pennsylvania	5,517	815	15	138	1,576
		Half-day session tickets	417				
		(Advance Registration)	(1,948)				
152nd	Sept.11-16	New York, New York	14,044	1,971	25	306	3,682
		Half-day session tickets	2,148				
		(Advance Registration)	(4,965)				
	1967						
153rd	Apr.9-14	Miami Beach, Florida	7,954	1,633	20	260	3,216
		Half-day session tickets	99				
		(Advance Registration)	(4,196)				
154th	Sept.10-15	Chicago, Illinois	10,658	1,828	25	282	3,786
		Half-day session tickets	706				
		(Advance Registration)	(4,329)				
	1968						
155th	Mar.31-Apr.5	San Francisco, California	10,357	2,090	21	320	4,137
		Half-day session tickets	934				
		(Advance Registration)	(5,840)				
156th	Sept.8-13	Atlantic City, New Jersey	10,614	2,056	24	308	4,076
		Half-day session tickets	1,270				
		(Advance Registration)	(4,953)				

TABLE I (continued)

	Date	Location	Registration	Papers	Number of Divisions	Number of Sessions	Number of Authors
	1969						
157th	Apr.13-18	Minneapolis, Minnesota	6,713	1,383	21	222	4,137
		Half-day session tickets	475				
		(Advance Registration)	(3,551)				
158th	Sept.7-12	New York, New York	11,958	2,387	25	353	4,903
		Half-day session tickets	2,185				
		(Advance Registration)	(7,247)				
	1970						
159th	Feb.22-27	Houston, Texas	3,728	834	10	137	1,635
		Half-day session tickets	347				
		(Advance Registration)	(2,555)				

TABLE II

REGIONAL MEETINGS

Year	Number of Meetings	Total Attendance	Number of Papers
1960	5	*	480
1961	3	*	326
1962	6	*	773
1963	4	*	610
1964	4	3014	951
1965	5	4663	910
1966	7	7548	1124
1967	6	5144	1004
1968	9	8536	1883
1969	8	6797	2149

* Data not available

TABLE III

1969 REGIONAL MEETINGS

Meeting	Location	Sessions	No. of Papers	Registration
4th Middle Atlantic Regional Meeting February 13-15	Washington, D. C.	49	308	1169
Metropolitan Regional Meeting May 1-2	New York, N. Y.	27	170	567
3rd Great Lakes Regional Meeting June 5-6	DeKalb, Ill.	28	163	502
Northwest Regional Meeting June 12-13	Salt Lake City, Utah	26	232	486
Western Regional Meeting Oct. 6-10	Anaheim, Calif.	58	328	1527
Midwest Regional Meeting Oct. 29-31	Kansas City, Mo.	20	155	813
Southeastern Regional Meeting Nov. 5-8	Richmond, Va.	47	339	1046
Southwest Regional Meeting Dec. 4-6	Tulsa, Okla.	34	228	687

TABLE IV

DIVISIONAL INTERIM MEETINGS

Division	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Agricultural and Food Chemistry	1	-	-	-	-	-	-	-	-	-
Analytical Chemistry	1	1	1	1	1	1	1	1	1	1
Chemical Marketing and Economics	-	-	-	-	-	1	-	-	-	-
Colloid and Surface Chemistry	1	1	2	1	1	1	1	1	1	1
Fluorine Chemistry	-	-	-	-	-	-	-	1	-	-
History of Chemistry	-	1	-	-	-	-	-	-	-	-
Industrial and Engineering Chemistry	1	1	1	2	2	2	2	2	2	2
Inorganic Chemistry	1	1	1	-	1	1	1	-	1	-
Medicinal Chemistry	1	-	1	-	1	-	1	-	1	-
Microbial Chemistry and Technology	-	-	-	-	-	-	-	-	1	-
Organic Chemistry	-	1	-	1	-	1	-	1	-	1
Physical Chemistry	1	1	1	1	-	1	1	1	1	-
Polymer Chemistry	-	1	1	-	1	-	1	-	1	-
Rubber Chemistry, Inc.	1	1	2	1	1	2	1	1	1	2

TABLE V

1969 DIVISIONAL INTERIM MEETINGS

Sponsor	Meeting	No. of Papers
Analytical Chemistry	22nd Annual Summer Symposium June 11-13	12
Colloid and Surface Chemistry	43rd National Colloid Symposium June 23-25	65
Industrial and Engineering Chemistry	6th Annual Summer Symposium June 9-11	12
Industrial and Engineering Chemistry	36th Annual Chemical Engineering Symposium December 15-16	10
Organic Chemistry, University of Utah, ACS Salt Lake Section	21st National Organic Chemistry Symposium June 15-19	10
Rubber Chemistry, Inc.	Spring Meeting April 29-May 2	55
Rubber Chemistry, Inc.	Fall Meeting October 14-17	42

TABLE VI

SECTION MEETING ATTENDANCE

Year	Number of Section Meetings	Total Attendance*	Average Attendance per Meeting*
1960	1,191	89,288	75
1961	982	85,641	87
1962	1,280	86,415	67
1963	1,271	83,320	66
1964	1,260	72,000	57
1965	1,229	70,000	57
1966	1,206	73,000	60
1967	1,218	73,000	60
1968	1,185	64,000	54
1969**	1,148	66,580	58

* In 1964 the system of reporting attendance was changed to record average attendance per meeting. The "Totals" figures for 1964-68 are calculated from the average figures.

** Number of regular section meetings (does not include subsection, topical group, joint meetings or symposiums or meetings-in-miniature).

TABLE VII

1969 SPECIAL MEETINGS: LOCAL SECTIONS

Sponsor	Meeting	No. of Papers
Society of Analytical Chemists of Pittsburgh and the Spectroscopy Society of Pittsburgh	20th Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy March 3-8	300
Oklahoma Sections (North Central, Northeast, Oklahoma, and Tulsa)	Annual Tetrasectional Meeting March 15-16	64
Louisiana Section	6th Annual Meeting-in-Miniature March 28	--
Western New York and Rochester Sections	Symposium April 11-12	6
Dallas - Ft. Wroth Sections	Meeting-in-Miniature April 25	21
Maryland Section and Chemical Society of Washington	Joint Meeting May 8	--
Florida Section	Meeting-in-Miniature May 8-10	45
Kalamazoo Section	14th Annual Symposium November 3	--
Analytical Groups of ACS New York and North Jersey Sections, Baltimore-Washington, Delaware Valley, New York, and New England Sections of the Society for Applied Spectroscopy; and the American Microchemical Society	Eastern Analytical Symposium November 19-21	80
Cleveland Section	Meeting-in-Miniature December 10	21

TABLE VIII

FUTURE PROGRAM FOR ACS MEETINGS

	Nat'l. Meetings	Regional and/or Multi Divisional Meetings	Conferences (Experimental)	Symposiums (Divisional)	Local Section Meetings
Frequency	One per year	8-10 per year	as required	annual or biennial as required	
Projected attendance at each	8,000-10,000	1,000-2,000	100-150	300-500	?
Format	Symposiums Topics of broad current interest Interdisciplinary Of public concern Professional aspects (employment, research funding)	Symposiums Restricted areas of interest - more technical in content Contributed papers Scheduled by Division and/or Local Sections	Discussion Group Single topical area	Symposiums Oriented along discipline or technology interest of Divisions	Monthly Meetings Invited speaker "Meetings-in-Miniature" Contributed papers
Organizing group	Special committee with Divisional	Local Section and/or 3-5 Divisions	Groups interested in area	Divisions	Local Sections

APPENDIX D

FINANCIAL SUMMARY

Financial Planning in five-year cycles has been standard ACS policy for many years. Two such cycles are presented herewith to provide a financial portrait of ACS in the following phases: (1) actual results of operations for calendar years 1966-1969; (2) the latest estimate of the current calendar year (1970) on the basis of actual experience to May 1, 1970; and (3) a forecast of revenues and expenses for each calendar year 1971-1975 on the basis of current and planned programs.

The forecast is based on the long-standing ACS premise that total operations must at least break even and, wherever possible, provide a reasonable addition to accumulated reserves for future operating contingencies. (To date, ACS liquid reserves represent approximately six months' normal operating costs.) Projected price changes are included in the revenue calculations for the forecast in accordance with this basic ACS principle. Forecast expenses include an allowance for a normal growth factor based upon the previous year's actual experience in addition to an estimated allowance for inflation. The sharp fluctuations in both revenues and expenses in each five-year cycle are caused primarily by the cyclical production of collective index volumes for CHEMICAL ABSTRACTS.

Grant and contract activities are categorized between research and development and all others. The figures for 1966-69 are the sum of actual grants and contracts awarded; the 1970 figures

are estimated as of May 1, 1970; the figures for 1971-1975 are projections of funds required for the programs outlined in the Plan to be presented on the scale and timetable planned. The amounts forecast for research and development represent estimates of the costs of those programs deemed to be in the public interest which ACS is unable, with its limited resources, to finance fully from current revenues and accumulated reserves. Some of these research and development programs include the costs of parallel operations of old and new composition systems to assure that current services are not disrupted during the development phase.

American Chemical Society
Schedule of Revenues and Expenses
1966 - 1970

(Dollars in Thousands)

	1966	1967	1968	1969	1970 As Estimated @5/1/70	Total 1966-1970
REVENUES:						
Membership Activities	1540	1603	1853	2097	3130	10223
Primary Publications	7577	7982	7916	8932	8915	41322
Chemical Abstracts Service	7941	8397	11610	14444	16401	58793
All Other Programs	1106	1116	1111	765	1088	5186
Grants & Contracts:						
Research & Development	1642	1867	2068	2669	2903	11149
Other	0	0	181	122	522	825
TOTAL REVENUES	19806	20965	24739	29029	32959	127498
EXPENSES:						
Research & Development-						
Membership Activities	0	0	0	0	48	48
Primary Publications	0	0	208	217	237	662
Chemical Abstracts Service	1269	1432	1482	1603	1850	7636
Grants & Contracts	1642	1867	2068	2669	2903	11149
Total Research & Development	2911	3299	3758	4489	5038	19495
Other Expenses-						
Membership Activities	1839	2118	2232	2456	2888	11533
Primary Publications	7471	8348	8592	9271	9515	43197
Chemical Abstracts Service	6949	8514	9607	12227	13372	50669
All Other Programs	360	374	494	101	645	1974
Grants & Contracts	0	0	181	122	522	825
Total Other Expenses	16619	19354	21106	24177	26942	108198
TOTAL EXPENSES	19530	22653	24864	28666	31980	127693
EXCESS OF REVENUES OVER EXPENSES	276	(1688)	(125)	363	979	(195)

American Chemical Society
Ten Year Financial Overview
1966 - 1975

(Dollars in Thousands)

	1971	1972	1973	1974	1975	Total 1971-1975	Total 1966-1970 (Per Schedule)	Total 1966-1975
REVENUES:								
Membership Activities	3213	3463	3310	3549	3630	17165	10223	27388
Primary Publications	10384	11212	11625	12363	12725	58309	41322	99631
Chemical Abstracts Service	14240	20494	23059	21864	22194	101851	58793	160644
All Other Programs	1020	687	626	640	759	3732	5186	8918
Grants & Contracts								
Proposed Research & Development	3565	4396	4817	5508	5515	23801	11149	34950
Other	970	302	25	151	66	1514	825	2339
TOTAL REVENUES	33392	40554	43462	44075	44889	206372	127498	333870
EXPENSES:								
Research & Development-								
Membership Activities	68	83	87	90	93	421	48	469
Primary Publications	278	301	313	320	341	1553	662	2215
Chemical Abstracts Service	1986	2355	2688	2802	3078	12909	7636	20545
Grants & Contracts (Proposed)	3565	4396	4817	5508	5515	23801	11149	34950
Total Research & Development	5897	7135	7905	8720	9027	38684	19495	58179
Other Expenses-								
Membership Activities	3069	3313	3419	3590	3704	17095	11533	28628
Primary Publications	10227	11395	12282	13166	14084	61154	43197	104351
Chemical Abstracts Service	13355	15521	17943	19283	20015	86117	50669	136786
All Other Programs	572	313	218	233	233	1569	1974	3543
Grants & Contracts	970	302	25	151	66	1514	825	2339
Total Other Expenses	28193	30844	33887	36423	38102	167449	108198	275647
TOTAL EXPENSES	34090	37979	41792	45143	47129	206133	127693	333826
EXCESS OF REVENUES OVER EXPENSES	(698)	2575	1670	(1068)	(2240)	239	(195)	44